

# METAL PRODUCTS MANUFACTURING

# MPM

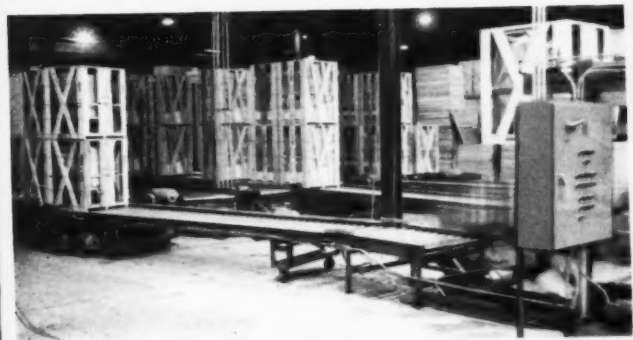
Serving the Appliances and  
Fabricated Metal Products Industry

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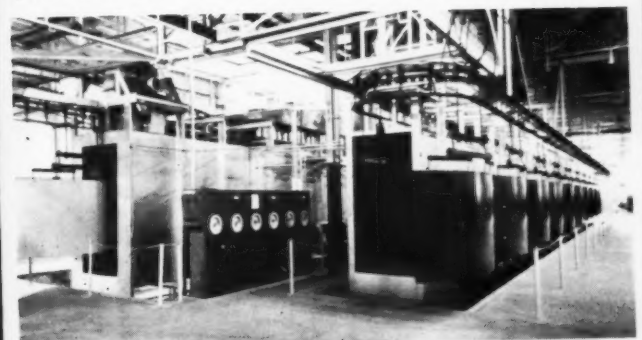
AUGUST 1960



Inventory Control Simplified With Computer Controls — Page 25

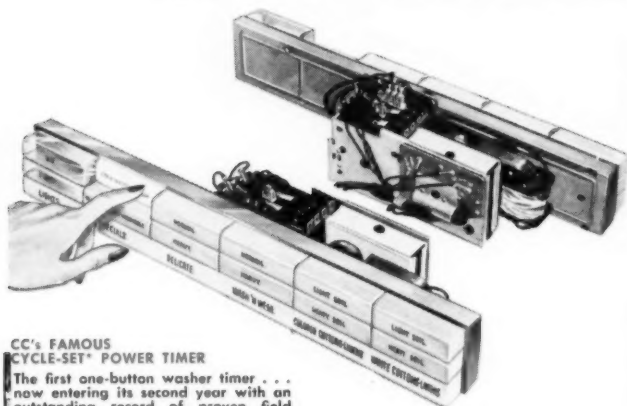


Speed Queen "3-for-1" System Streamlines Handling, Shipping — Page 80



Plant Addition Triples Harvestore Production Capacity — Page 32

# Every appliance made today can be controlled just a little bit better with... **CONTROLS**



CC's FAMOUS  
CYCLE-SET® POWER TIMER

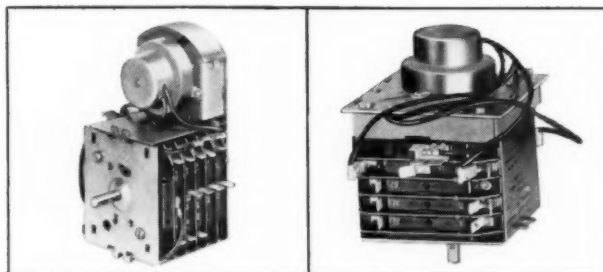
The first one-button washer timer... now entering its second year with an outstanding record of proven field performance! Amazingly low record of service attention.

\*Trademark






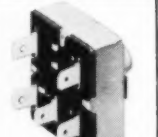


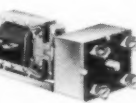
Individual components or completely integrated systems. Whichever you choose, you can be sure of this: Controls Company products are function-mated to the appliances they control. Field records show this results in extra value that helps sell the end-product... and keep it sold!

Shown here are some of the CC controls now helping to make many appliance lines just a little bit better than competition. Write for facts about these and other CC controls.



LATERAL TIMERS — Just 2-17/32" deep. For washers, dryers, combinations, dishwashers, other automatic equipment.

TANDEM TIMERS — Drive mechanism to rear of switch case for "tight-squeeze" installation in automatic equipment.

|  |   |   |  |   |   |  |
|--|---|---|--|---|---|--|
|  <p><b>SOLENOIDS</b> — Exclusive double-T plunger means more pull for more applications. Four types, twelve models.</p> |  <p><b>SNAPAC SWITCHES</b> — 750 Series (shown) for limit, safety interlocking, door and control switch needs.</p> |  <p><b>PRESSURE SWITCHES</b> — Single and multi-level pressure. Designed to control liquid levels.</p> |  <p><b>ROTARY SWITCHES</b> — Compact 777 Series (shown) ideal for appliances, vending machines.</p> |  <p><b>SYNCHRONOUS MOTORS</b> — offer eleven speeds, three shaft types, two lube systems.</p> |  <p><b>INTERVAL TIMERS</b> — Type 105 (shown) for preset appliance time control.</p> |  <p><b>SOLENOID OPERATED SWITCHES</b> — Type 12270 makes, breaks two circuits simultaneously.</p> |
|--|---|---|--|---|---|--|



Creative Controls for Industry  
**CONTROLS COMPANY OF AMERICA**

APPLIANCE AND AUTOMOTIVE CONTROLS DIVISION

9559 Soreng Ave., Schiller Park, Ill. • Cooksville, Ontario

# 3 SPECIAL ARMCO STEELS SERVE IN NEW THERMADOR UNIT



Use the STEELMARK  
to identify attractive,  
durable steel in the  
products you sell.



Armco Stainless Steel, Enameling Iron, and ALUMINIZED STEEL help add beauty, efficiency and durability to this new unit manufactured by Thermador Electrical Manufacturing Company, Los Angeles, California.

Easy-to-clean Armco 17 (Type 430) Stainless Steel lends good looks and toughness to cooking surface, back panel, oven door frames, and the kitchen ventilator front frame.

Porcelain enamel on Armco Enameling Iron provides a durable lining for both oven compartments.

Heat-reflective surfaces of Armco ALUMINIZED STEEL Type 1 help give maximum efficiency to heating elements at tops of the ovens.

## HELP YOU SELL AND SAVE

Consider the ways in which these and other Armco Special Steels can help you design more salable appliances . . . hold production costs down. Call your nearest Armco Sales Office for more information about these steels, or fill out and mail the coupon.

New steels are  
born at  
Armco

**ARMCO STEEL CORPORATION**  
1790 Curtis Street, Middletown, Ohio

SEND INFORMATION ON

- ☐ Armco 17 Stainless
- ☐ Armco Enameling Iron
- ☐ ALUMINIZED STEEL Type 1

Name \_\_\_\_\_ Title \_\_\_\_\_

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City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

## What has Kerns Drawing Compound got to do with . . .



The Cribben & Sexton Company, a subsidiary of the Waste King Corporation and manufacturers of Waste King Universal free-standing and built-in ranges and ovens, have been users of *Kerns Drawing Compounds* in all of their drawing operations for over 20 years. Cribben & Sexton have found that *Kerns Drawing Compounds* increase tool life, are economical, and result in superior draws . . . simple or complex, shallow or deep. They have also found the *Kerns* organization is *always on the job when new problems arise* . . . always ready to formulate new compounds to meet new production requirements. *It is this added plus . . . SERVICE*, in addition to quality of product, that has resulted in Cribben & Sexton being a user of *Kerns Drawing Compounds* for almost a quarter of a century!

Cribben & Sexton also depend on Kerns for supplying Cleaners, Strippers and Phosphatizing Compounds.

### ONLY KERNS OFFERS SO MUCH!

**ECONOMY**—because you get less scrap . . . cuts costly rejects of parts, etc.

**DRAWABILITY**—permits severe draws. In many cases deep draw quality stock can be replaced by commercial quality stock.

**RUST PREVENTION**—excellent rust protection even during extended storage.

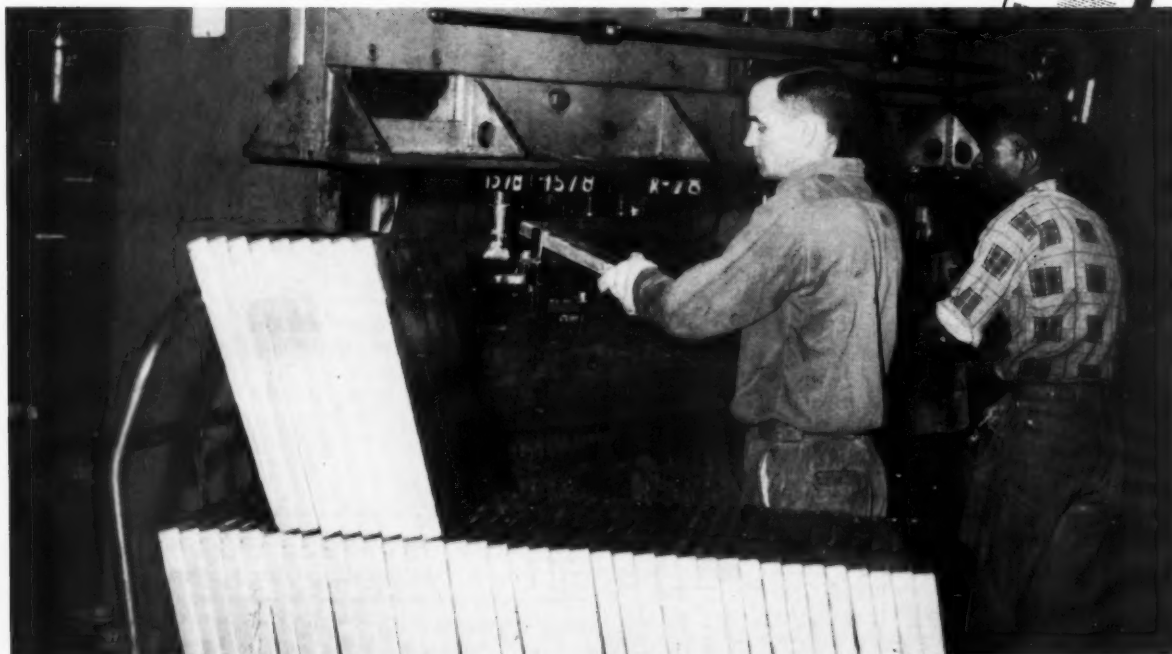
**CLEANABILITY**—coated parts will clean with utmost ease.

*Try it . . . prove it to yourself by using Kerns.*

#### MEMO BILLING TRIAL BASIS

*Kerns will supply material for production test . . . no formal invoice rendered unless completely approved in production.*

*Write for Technical Data Sheet on Kerns Drawing Compounds.*



formerly L. R. KERNS COMPANY



## KERNS UNITED corporation

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Subsidiary Plant: KERNS PACIFIC CORPORATION, 630 BATAVIA STREET, ORANGE, CALIFORNIA



# MPM

(including finish)

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**AUGUST • 1960**

**VOL. 17 • NO. 8**

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## METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

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Stainless Steel

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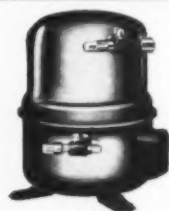


# Compact, quiet and economy-priced Welded Motor-Compressors

for room air conditioners...residential  
and commercial air conditioners...heat  
pumps...freezers...refrigerators...vending  
machines...beverage coolers...water coolers

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Copeland has  
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## COPELAWELD hermetics $\frac{1}{8}$ H.P. through 4 H.P.



Copelaweld 4-cylinder models  
...2½, 3, 3½ and 4 H.P.



Copelaweld 2-cylinder models  
...½, ¾, 1, 1½ and 2 H.P.



Copelaweld Space Savers  
...½ H.P. through ½ H.P.

For complete specifications and performance data, request  
form numbers 6018 and 5909. For Copelaweld condensing  
units, ½ H.P. through ½ H.P., form number 6017.

Listed below are representative specifications for each  
horsepower range. Many more models are available, de-  
signed to meet individual requirements.

Day in and day out, Copelaweld motor-compressors are quietly  
going about the business of making both manufacturers and users  
happy. These welded hermetics perform with smooth, quiet  
efficiency... deliver high output per watt-hour of power... give  
long, trouble-free service.

The best way... the most economical way... to insure customer  
satisfaction is to equip your product with Copelaweld  
welded hermetics. Consider Copelaweld for *all* your  
welded applications... now through 4 H.P.



### Copelaweld ½ H.P. through 4 H.P. SPECIFICATIONS

| Model     | H.P. | Cyls. | Bore   | Stroke | C.F.M.<br>Displ. | RPM  | Suct.<br>Valve | Disch.<br>Valve | Refrig. | Oil<br>Charge | Net<br>Wgt. | Ship<br>Wgt. | Capacity<br>BTU/HR |
|-----------|------|-------|--------|--------|------------------|------|----------------|-----------------|---------|---------------|-------------|--------------|--------------------|
| CF-18S    | ¼    | 1     | 1.075" | .625"  | 34.3             | 1750 | ⅝"             | ¼"              | R-12    | 30 oz         | 24          | 28           | 818                |
| CF-20S    | ¼    | 1     | 1.288" | .625"  | 49.2             | 1750 | ⅝"             | ¼"              | R-12    | 30 oz         | 25          | 29           | 1120               |
| CF-25S    | ¼    | 1     | 1.175" | .625"  | 81.0             | 3500 | ⅝"             | ⅝"              | R-12    | 28 oz         | 31          | 35           | 1890               |
| CF-33S    | ½    | 1     | 1.288" | .625"  | 97.0             | 3500 | ⅝"             | ⅝"              | R-12    | 28 oz         | 32          | 36           | 2340               |
| UF5-50    | ½    | 2     | 1½"    | ⅝"     | 95.2             | 1750 | ⅝"             | ⅝"              | R-22    | 48 oz         | 58          | 63           | 5100               |
| UD7-75    | ¾    | 2     | 1½"    | ⅝"     | 132.8            | 1750 | ⅝"             | ⅝"              | R-22    | 48 oz         | 64          | 69           | 7850               |
| UH9-100   | 1    | 2     | 1½"    | ⅝"     | 202.0            | 1750 | ⅝"             | ⅝"              | R-22    | 48 oz         | 65          | 70           | 13350              |
| UI10-150  | 1½   | 2     | 1¾"    | ⅝"     | 245.0            | 1750 | ⅝"             | ⅝"              | R-22    | 48 oz         | 70          | 75           | 16600              |
| USS11-200 | 2    | 2     | 1¾"    | 1⅝"    | 324.0            | 1750 | ⅝"             | ⅝"              | R-22    | 48 oz         | 72          | 77           | 22650              |
| 4U16-252  | 2½   | 4     | 1½"    | 1½"    | 443.0            | 1750 | ⅝"             | ⅝"              | R-22    | 105 oz        | 125         | 134          | 28900              |
| 4U18-302  | 3    | 4     | 1¾"    | 1½"    | 481.0            | 1750 | 1⅝"            | ⅝"              | R-22    | 105 oz        | 125         | 134          | 32700              |
| 4U22-352  | 3½   | 4     | 1¾"    | 1½"    | 561.0            | 1750 | 1⅝"            | ⅝"              | R-22    | 105 oz        | 136         | 146          | 39400              |
| 4U26-402  | 4    | 4     | 1¾"    | 1½"    | 647.0            | 1750 | 1⅝"            | ⅝"              | R-22    | 105 oz        | 136         | 146          | 44800              |

NOTE: ¼ H.P. through ½ H.P. capacity at 15° F. Evaporating Temperature, 120° F. Condensing Temperature.  
½ H.P. through 4 H.P. at 45° F. Evaporating Temperature, 130° F. Condensing Temperature. 65° F. return gas and no liquid subcooling.

SINCE 1918

**Copeland**

REFRIGERATION CORPORATION, Sidney, Ohio

Manufacturers of performance-proved  
motor-compressors and condensing units  
for air conditioning and refrigeration



# PRECISION

**IS STANDARD  
PRACTICE AT  
KING-SEELEY**

PRECISION at King-Seeley is basic policy—a common denominator of all engineering, manufacturing and inspection. It is the reason for the enviable performance and service reliability by which K-S products have come to be known throughout the automotive and appliance industries.



**KING-SEELEY  
DIVISION  
OF  
KING-SEELEY CORPORATION  
ANN ARBOR, MICHIGAN**



## AUTOMOTIVE

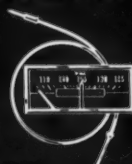
Forty years ago the first practical gasoline gauge for automobiles was introduced by King-Seeley—the hydrostatic "Telegage." Later came the transition to the more precise and dependable all-electric gauge system—another K-S achievement.



The precision, reliability and flexibility of the K-S engine-speed governor have won it top preference with motor truck manufacturers.

## APPLIANCE CONTROLS

Rapid progress in Appliance Controls started six years ago when King-Seeley introduced the first built-in electric meat thermometer to eliminate the stoop-and-squint routine in oven roasting. Next King-Seeley provided the two-pointer signalling type unit.



The newest all-electric Roast Control by King-Seeley assures any selected degree of doneness regardless of how long actual serving time is delayed.

The new Chef-O-Matic surface element temperature control has taken all the guesswork out of top-side warming, boiling and frying.

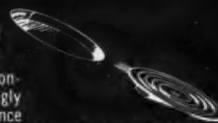
These have added progressively greater precision and automaticity to the art of cooking.

## YOUR NEW APPROACH TO THE CONTROL QUESTION

There can be little question of control functions becoming increasingly important as a factor in appliance sales—hence the aggressive drive right now for controls having greater market appeal.

King-Seeley is continuing its expansion and development of appliance controls. New dryer and oven controls are being developed now. May we work with you on new Precision control systems?

Investigate with King-Seeley before programming your new models. You may save considerable time and avoid expensive headaches by turning your control problems over to us.



## FOR LAUNCHING SALES SATELLITES STANDARDIZE

If you're making sales plans for a new model or new product soon to be launched into orbit, Southern fasteners will help assure its success.

Southern specializes in the manufacture of standard fasteners. Top quality materials and workmanship are combined to produce the most dependable production fastener your money can buy. Burr-free heads and durable threads help step up driving speed in assembly, and thus costly down-time, rejects and injured materials are reduced.

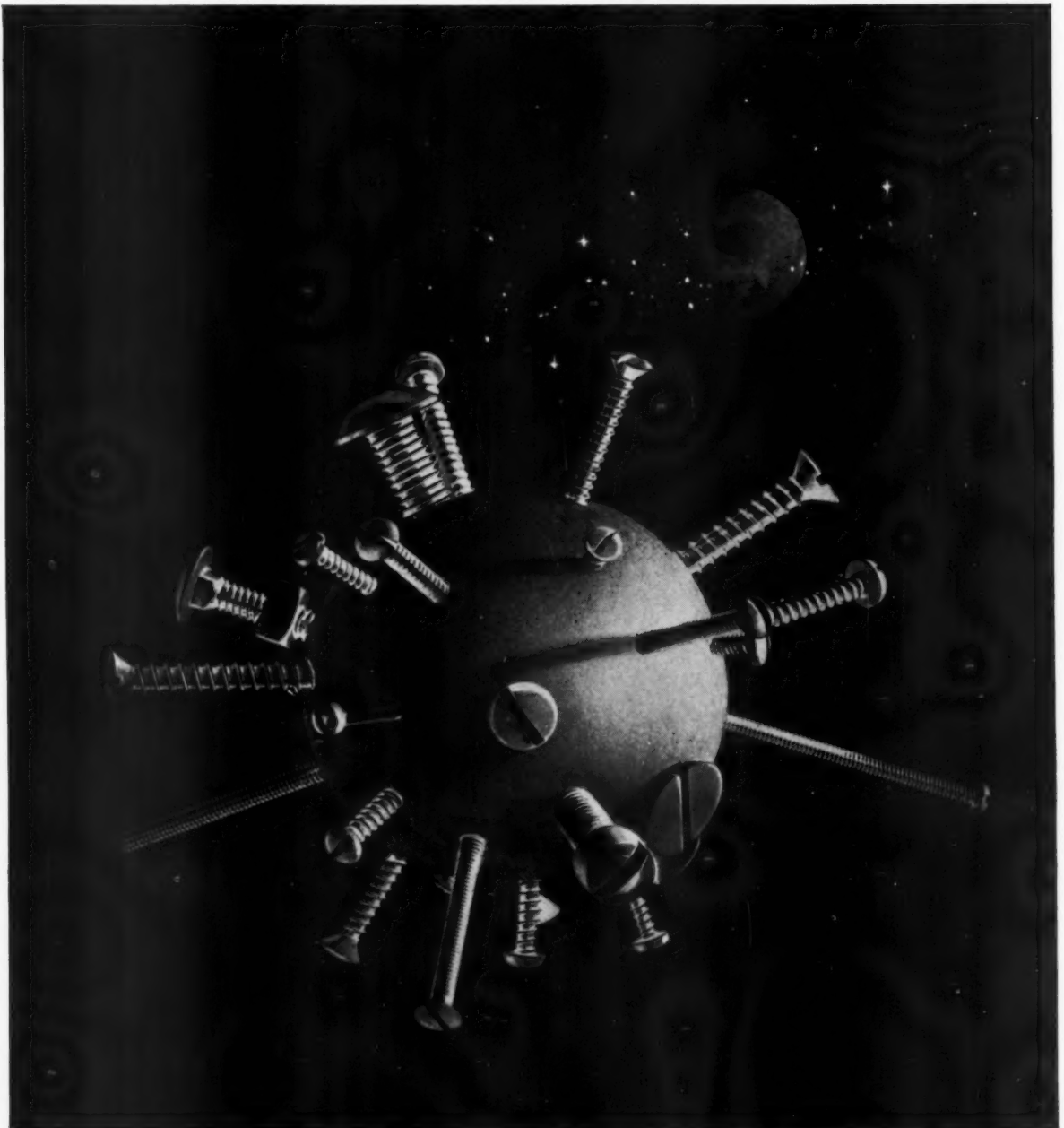
Order USA-made Southern fasteners today. Call your nearest Southern distributor, or write direct to factory: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Manufacturing and Main Stock in Statesville, North Carolina. Warehouses: New York • Chicago • Dallas • Los Angeles.

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FASTENERS**



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## stainless steel

No other metal has the strength, beauty and versatile qualities that serve you so well today and promise so much for tomorrow.

There is nothing like  
stainless steel for  
**THE AUTOMOTIVE INDUSTRY**



McLouth Steel Corporation,  
Detroit 17, Michigan

*Manufacturers of high quality  
Stainless and Carbon Steels*



Look for the **STEELMARK**  
on the products you buy.

**McLOUTH STAINLESS STEEL**

## Two advanced **Verson** processes combined to provide more efficient production of machined parts.

In a perfect blending of two of metalworking's most efficient production processes, Verson has developed the Transmat-Impact Machining Press. It utilizes the Transmat principle of mechanical fingers to move the piece part from one station to the next. It also utilizes the cold extrusion principle of Impact Machining to form in two strokes of the press a part that previously had to be machined from a piece of solid bar stock by metal removal processes.

The part formed is the master cylinder for automotive

brake systems. One Transmat-Impact Machining Press produces them at the rate of 30 per minute and replaces a bank of automatic screw machines. Material consumption is reduced by 47%. Impact Machining completely finishes the bore, ready for installation, and produces a significantly stronger part.

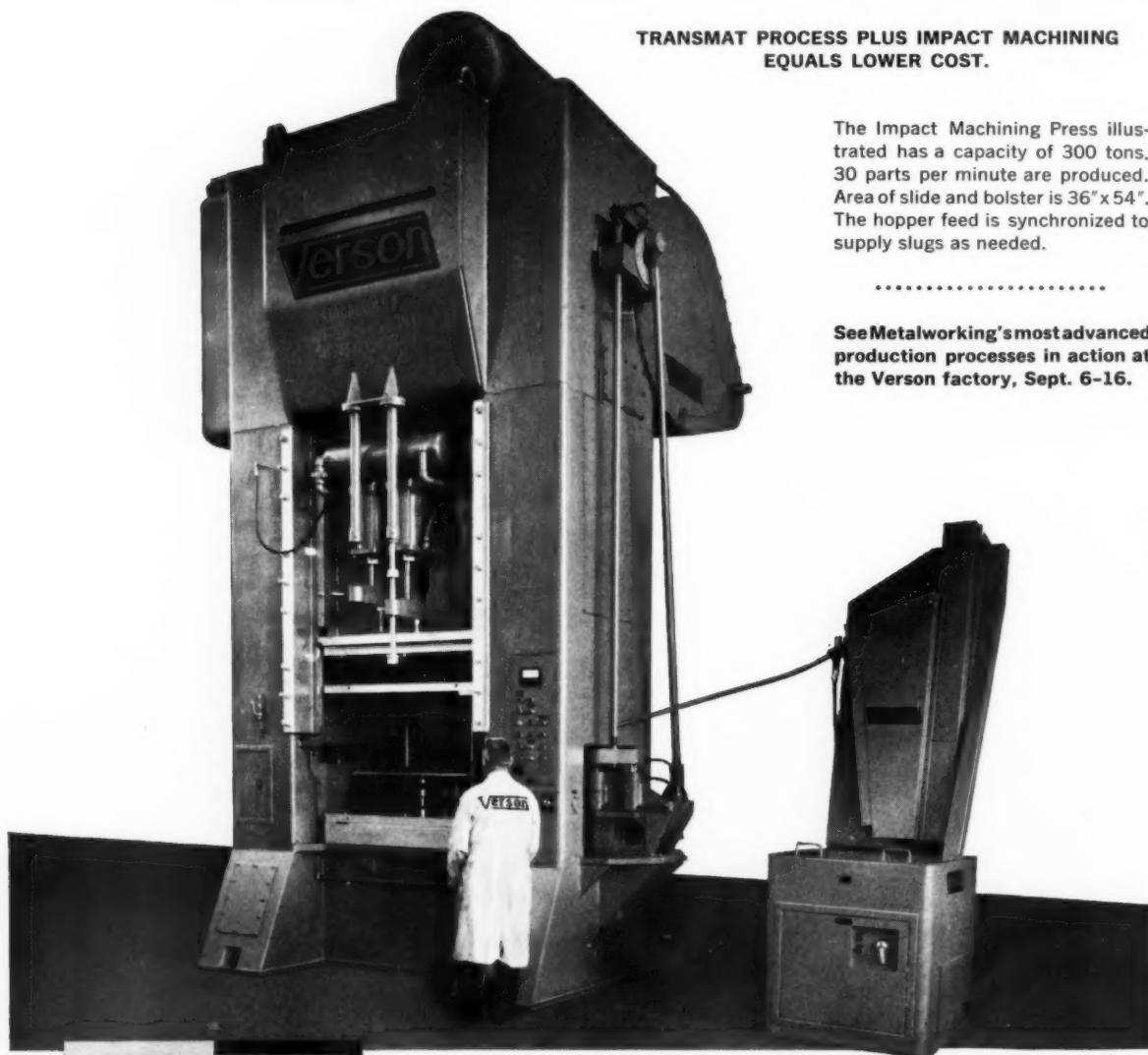
If you produce machined parts in quantity, you owe it to yourself to investigate Impact Machining and Transmat-Impact Machining. For full information and recommendations, send an outline of your requirements.

### TRANSMAT PROCESS PLUS IMPACT MACHINING EQUALS LOWER COST.

The Impact Machining Press illustrated has a capacity of 300 tons. 30 parts per minute are produced. Area of slide and bolster is 36"x 54". The hopper feed is synchronized to supply slugs as needed.

.....

See Metalworking's most advanced production processes in action at the Verson factory, Sept. 6-16.



240



Originators and pioneers of allsteel stamping press construction

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## MPM

### editor's mail

#### The bearing market in Brazil

Gentlemen: We owe your address to Mr. Bartlet, component of the American Economic mission who now is visiting Sao Paulo.

We told Mr. Bartlet we are manufacturers of self lubricated bushings and bearings, made by sinterized bronze powder.

We informed Mr. Bartlet that we would like to contact some American firms in order to study the possibility of enlarging our line production, including new products, as well as of manufacturing parts in sinterized iron powder, with and without backsteel.

Mr. Bartlet told us that you could perhaps accomplish this contact suggesting U. S. firms eventually interested in entering the Brazilian market, which is continually growing.

Thanking you in advance for your kind attention to the matter.

Mancal S. A.  
Avenida Mofarrej 1.104  
(Vila Leopoldina)  
Caixa Postal S. P. 11.796  
Sao Paulo, Brazil

We suggest that any readers interested in following this communication from a neighboring country contact Mancal S. A. direct.

The Editors

#### Product case histories

Gentlemen: I read your magazine regularly and find it very helpful — particularly the new product case histories. Thanks for keeping me on the mailing list.

Donald B. Lowe  
Industrial Designer  
Villa Park, Ill.

#### Additional copies

Gentlemen: I would appreciate receiving a dozen copies of the June, 1960 issue of MPM.

If there is any charge, please forward invoice.

D. V. High, General Manager  
Architectural Division  
General Steel Wares, Ltd.  
Toronto, Ontario, Canada

#### Aid in research

Gentlemen: Mr. Mehmet Yontar, our project engineer, would very much appreciate being put on the controlled circulation list to receive your publication, METAL PRODUCTS MANUFACTURING.

Mr. Yontar does the research work for all the McGraw-Edison Appliance Divisions, and feels this periodical would be most helpful.

Elizabeth T. Smith, Librarian  
Thomas A. Edison Research Laboratory  
Division of McGraw-Edison Co.  
West Orange, N. J.

## GENERAL INDUSTRIES

# Smooth Power

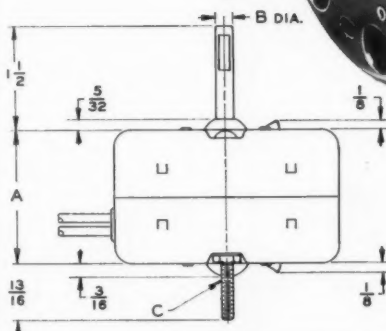
## AC MOTORS

1/1800 H. P. TO 1/35 H. P.

## ADVANCED MOTOR DESIGNS

that meet the demands of the most exacting requirements

Nearly half a century of design and manufacturing experience in the small motor field enables G. I. to offer the most advanced engineering features. This, together with top-notch production know-how and latest manufacturing facilities assure you quality, dependability and economy so necessary to the success of your products.



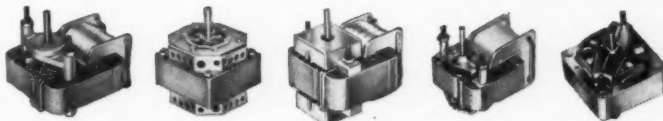
### MODEL-B FOUR POLE, FOUR-COIL SHADED POLE MOTOR

Designed for long life and dynamically balanced for extremely quiet operation. Self aligning, self lubricating bronze bearings, baked, varnish-impregnated windings, ample oil reservoir located for easy lubrication. Smooth, quiet — field proven!

| MODEL               | HP<br>1500<br>RPM | Locked<br>Torque<br>in./oz. | Max.<br>Torque<br>in./oz. | Free<br>Speed<br>RPM | Amps<br>1500<br>RPM | Watts<br>1500<br>RPM | A        | B    | C     | Wt.<br>Lbs. |
|---------------------|-------------------|-----------------------------|---------------------------|----------------------|---------------------|----------------------|----------|------|-------|-------------|
| B-5-CW<br>B-5-CCW   | 1/80              | 3.5                         | 11                        | 1735                 | .7                  | 53                   | 1 1/8"   | 1/4" | 8-32  | 2.0         |
| B-8-CW<br>B-8-CCW   | 1/50              | 4.0                         | 14                        | 1750                 | .85                 | 63                   | 2 3/8"   | 1/4" | 10-32 | 2.7         |
| B-10-CW<br>B-10-CCW | 1/40              | 4.7                         | 18                        | 1750                 | .95                 | 72                   | 2 3/8"   | 3/8" | 10-32 | 3.1         |
| B-12-CW<br>B-12-CCW | 1/35              | 4.7                         | 20                        | 1760                 | 1.05                | 77                   | 2 13/16" | 3/8" | 10-32 | 3.4         |

Above base on fan application with air stream flowing over motor, without air flow derating necessary.

### Designs to Meet the Needs of a Wide Range of Applications



Write today for catalog sheet and quantity-price quotations.



THE GENERAL INDUSTRIES CO.

DEPT. GF • ELYRIA, OHIO



**Vitrenamel Steel is a Fixture at Eljer.** "We have used USS Vitrenamel in this plant since 1946," says R. M. Wilson, Plant Manager of the Formed Steel Division of Eljer Co., Scranton, Pa. "Our original reason for purchasing Vitrenamel was its reputation for quality, because Eljer's own reputation for quality must be maintained. We've never been disappointed. We like Vitrenamel's ductility, its finish, and its warpage resistance at high temperatures," Mr. Wilson continues. "It has given us consistently good results throughout the years."



Here's a good case of a product living up to its reputation. Eljer's long record of success with Vitrenamel is proof of its quality performance. Vitrenamel sheets take severe forming, and after porcelain enamel coating, fire to a smooth finish free from surface defects. Vitrenamel has high resistance to warpage and sagging at high temperatures—so parts retain their shape. Specify USS Vitrenamel steel for porcelain enameling, available in cut lengths or coils.

*USS and Vitrenamel are registered trademarks*

United States Steel Corporation—Pittsburgh  
Columbia-Geneva Steel—San Francisco  
Tennessee Coal & Iron—Fairfield, Alabama  
United States Steel Supply—Steel Service Centers  
United States Steel Export Company  
**United States Steel**





## NAME PLATES & DECORATIVE TRIM

★  
DIE COSTS **\$35**  
*as low as*

Certain smaller, simpler dies qualify for the minimum charge of \$35.00 — others are equally as reasonable. And your own trade mark or trade name design can be accurately reproduced by La France craftsmen. Choice of finishes and fastening methods. Automated equipment and completely integrated production facilities make additional economies available from La France — specialists in the die cast name plate and decorative trim field! Compare for yourself, forward a sample of your name plate or print, or request to have an original design submitted with a quotation for your approval.

*Free*

write for sample name plate and technical bulletin.

**La France®**  
PRECISION CASTING CO.  
— for the name in front!

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SKIP  
ONE  
TRIP  
THROUGH  
THE  
FURNACE...

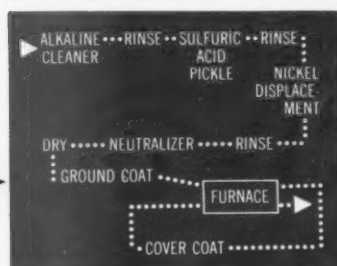


# NOW! PRACTICAL DIRECT-ON PORCELAIN ENAMELING WITH

# Pfizer CITRIC ACID

(THE RAY-DAVIS CITROBOND\* PROCESS)

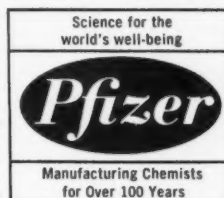
## CONVENTIONAL 2-COAT PROCESS RAY-DAVIS CITROBOND PROCESS



■ Now you can produce excellent, one-coat porcelain enamel finishes on metal surfaces. Your present equipment, only slightly modified, can bring you the advantages of the new money-saving development....CITROBOND.

■ The principal innovation in the process occurs in the pickling bath—Pfizer Citric Acid is used in place of the sulfuric acid employed in conventional two-coat processing. ■ Citric acid so prepares the metal that a ground coat is unnecessary. You apply the cover coat directly. Each piece requires just one firing—in your present furnace, of course. The result is enameled steel, with excellent bond and a finish that will satisfy any customer. Excellent results can also be obtained using the CITROBOND Process with the new direct-on steels. ■ Pfizer will be glad to send you technical information on the modern Ray-Davis CITROBOND Process. The coupon below is for your convenience.

\* Process developed by W. G. Ray, Chas. Pfizer & Co., Inc., and Shipp C. Davis, Daco Corp.



## IMPORTANT ADVANTAGES OF THE CITROBOND 1-COAT PROCESS

- no special handling of pickled steel required
- no major installation of special equipment required
- non-premium type steels can be used
- only one application—the finish coat
- citric acid is dry, non-toxic, water-soluble—easy to handle

MAIL THIS COUPON TO:

CHAS. PFIZER & CO., INC.,  
CHEMICAL SALES DIVISION  
630 FLUSHING AVENUE,  
BROOKLYN 6, N. Y.

PLEASE SEND ME:

- ☐ TECHNICAL INFORMATION  
☐ SAMPLE OF STEEL PORCELAINIZED BY RAY-DAVIS CITROBOND PROCESS

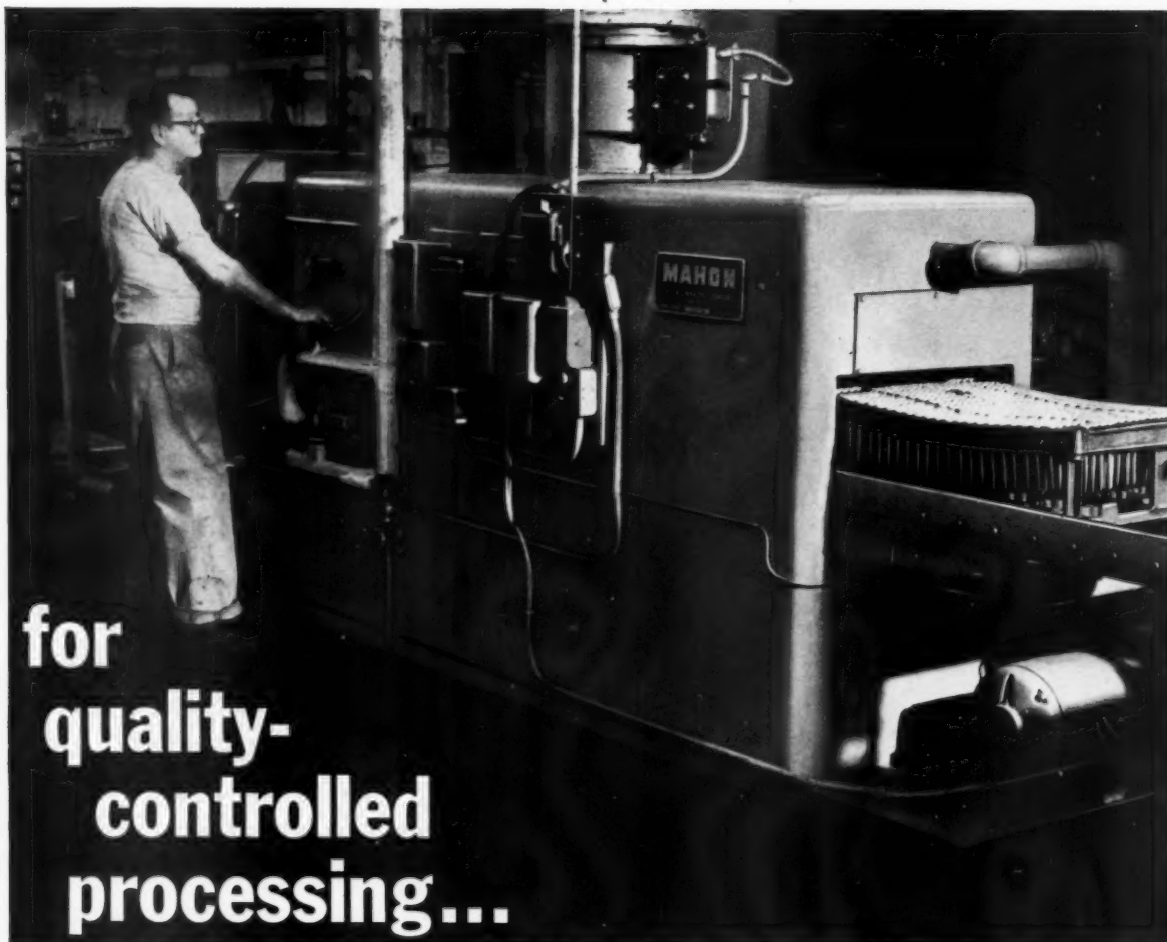
Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

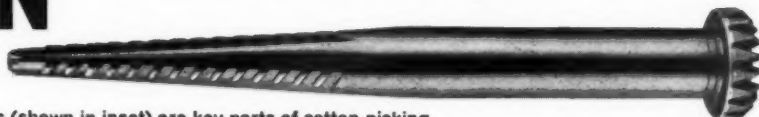
BRANCH OFFICES: Clifton, New Jersey; Chicago, Illinois; San Francisco, California; Vernon, California; Atlanta, Georgia; Dallas, Texas; Montreal, Canada



**for  
quality-  
controlled  
processing...**

**industrial  
equipment  
by MAHON**

'cotton-picking' spindles thoroughly cleaned  
500 at a time for International Harvester



Hardened, chromium-plated, barbed spindles (shown in inset) are key parts of cotton-picking machines made by International Harvester Company. These spindles are the metal 'fingers' that actually field-pick the cotton—several million are produced each year at IH's Memphis, Tenn., Works. A critical step in processing these parts is thorough cleaning before heat treating and plating. Removal of oil, grease, and foreign matter from the spindle surfaces is essential to insure uniform hardness . . . and long product life.

For "quality-controlled processing" the spindles are washed and dried in Mahon equipment. This special machine, developed for International Harvester from Mahon Industrial Equipment Division 'almost-standard' designs, means production efficiency . . . product quality . . . faster delivery and reasonable cost. Over the years Mahon equipment is your best investment. Call in a Mahon industrial engineer; let him prove why.

In cleaning a 500-piece-load of cotton-picking spindles, the two-stage Mahon machine washes the parts with detergent in hot water (at 180°F); then hot-air dries the load at (250°F). Automatic cycle time is about 15 minutes per load.

YOUR BIGGEST VALUE IS IN MAHON'S PLANNING & ENGINEERING EXPERIENCE

**THE R. C. MAHON COMPANY**

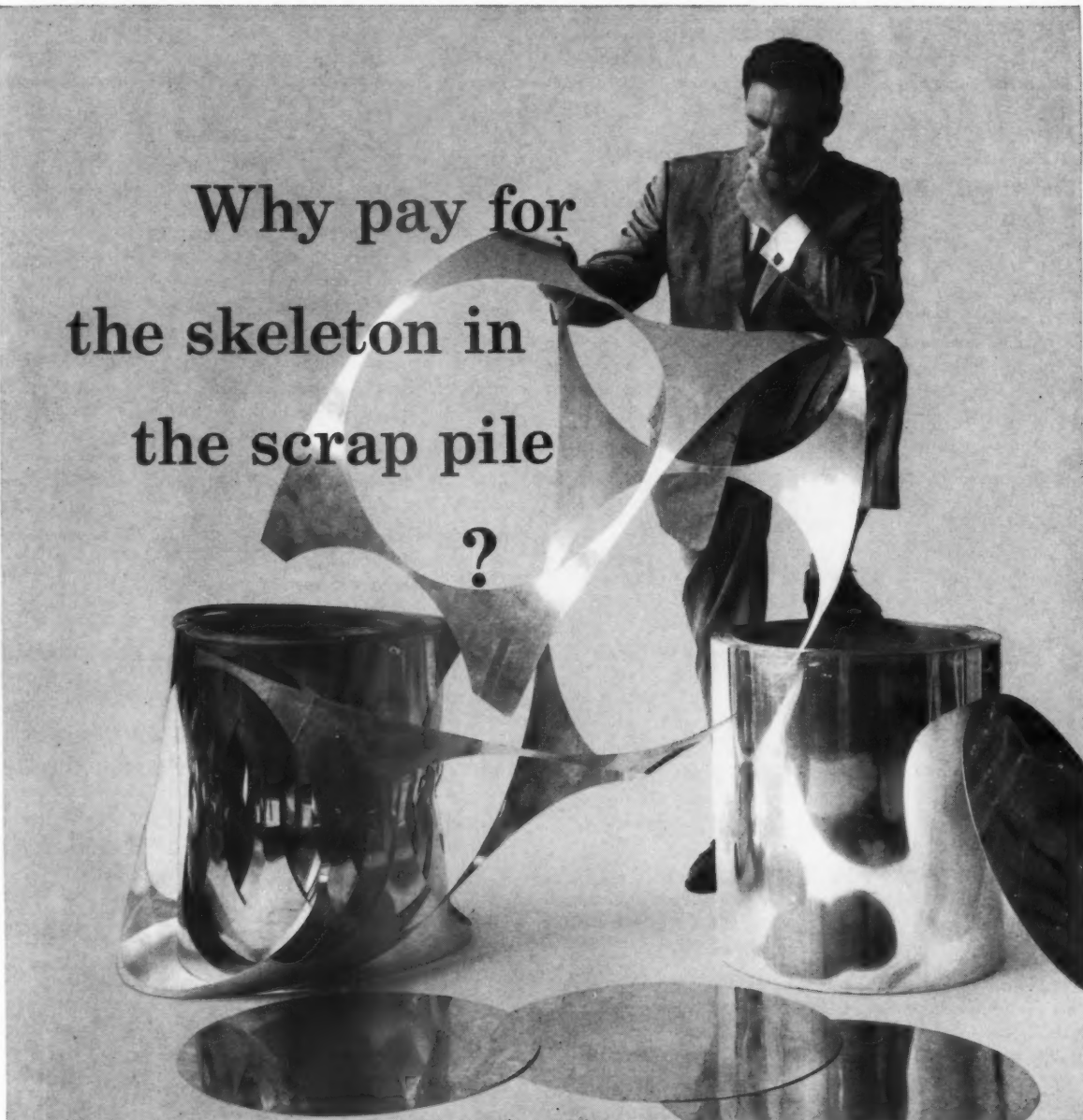
DETROIT 34, MICHIGAN

MANUFACTURING PLANTS—Detroit, Michigan and Torrance, California  
SALES-ENGINEERING OFFICES—Detroit, New York,  
Chicago, San Francisco and Torrance.

**MAHON**

Why pay for  
the skeleton in  
the scrap pile

?



**WHEN** you stamp your own aluminum circles or any irregular blanks, up to 25% of coil weight ends up as scrap.

You can eliminate this waste—plus labor of shearing and blanking—by buying circles or blanks direct from Fairmont.

Fairmont is *the* source for circles. As a prime supplier of aluminum blanks to *every* utensil maker, Fairmont's 30-year stockpile of dies is unduplicated anywhere. Find out how easily we can fill your requirements from our stock of dies.

Or by blanking from your dies in our plant, we can effect labor, material savings for you.

Other Fairmont benefits: the consistent quality that is a Fairmont tradition . . . individual flash annealing for finer grain structure . . . 100% inspection of every blank.

**FIND OUT ABOUT FAIRMONT'S  
CUSTOM BLANKING SERVICE NOW**

A Fairmont engineer will be glad to give you details. Call your local Fairmont office. Or write Vice President, Sales, Dept. 22H, Fairmont Aluminum, Fairmont, West Virginia.

**FAIRMONT ALUMINUM**

subsidiary of

**CERRO**

DE PASCO CORPORATION



## MORE ABOUT ANNUAL MODELS AND OBSOLESCENCE . . .

**E**XECUTIVES OF AMERICAN MOTORS and its Kelvinator Division continue to pound home their story of basic product improvement versus annual models. It would seem entirely possible that the logic set down in their arguments could have its effect on the policies of other leading appliance and metal products manufacturers.

The following are a few comments from recent statements by three of the top brass at American Motors and Kelvinator Division.

**George Romney, president of American Motors:** "American business must recapture its sense of fundamental purpose and service, or face a revolt by consumers whose discretionary buying now represents the difference between good and bad times for individual industries and the nation as a whole . . .

"The inevitable waste inherent in a principle of outdating products meant for a long, useful life contradicts the common-sense of the American consumer, however glibly it is rationalized. It seems to the consumer — and with reason — that the application of such a principle to most durable goods is contrary to her interest and can only have as its prime purpose an increase in business profits at her expense . . .

"The attempt annually to create products that are merely camouflaged to seem better is a colossal misdirection of effort away from useful innovation.

"The result can only be hypocrisy and cynicism among businessmen themselves, and growing criticism from consumers who will defer their purchases where possible and seek government intervention if necessary."

**B. A. Chapman, executive vice president of American Motors and general manager, Kelvinator Division:** "Pressure calls forth greater effort and sparks greater achievement. But the kind of pressure that produces better goods is the pressure from other creative minds — not competition from the calendar. Competition with the calendar simply siphons off creative energy and everybody ends up producing trivia with consoling consistency, while important benefits are unnecessarily delayed.

"Kelvinator's constant basic improvement policy is geared to the development of more fundamental and significant improvements by virtue of eliminating insignificant, time-consuming face-lifts. The ultimate test of the desirability of change is its degree of consumer benefits. . . .

"There is no question in my mind but that the entire appliance industry is sincerely dedicated to serving the consumer and of producing better products faster. But it takes more than dedication to create genuine consumer benefits. The annual model change is a principle that is in basic conflict with the pursuit of true consumer benefit, and as long as it is adhered to, it inevitably perverts the industry in practice, away from the goal to which it universally subscribes in theory . . ."

From the constructive angle, Chapman touches on three new principles among the opportunities for basic research,

which may eventually be reflected in improved appliance equipment. In this connection he said, "In this decade three new principles offer hope of a fresh breakthrough in major appliances — refrigeration by thermoelectrics, cooking and other heating by electronics and cleaning and waste disposal by ultrasonics."

**Homer Travis, vice president-sales, Kelvinator:**

To be specific, Travis described some of the mechanical improvements that had been made to improve performance and dependability, but did not involve exterior changes visible to the purchaser. One example referred to was a new water valve that compensates for variable water pressures and cuts down on water consumption by "almost one-third."

Travis emphasized the fact that "overall improvement in product performance is the result of our engineering and styling departments spending their time working toward basic product improvement."

## NEW AD PRACTICES CODE FOR HOME LAUNDRY\* . . .

**T**HE AMERICAN HOME LAUNDRY Manufacturers' Association released under Chicago date line of June 24 a booklet including "Recommended advertising practices for the home laundry appliance industry." Also included in the booklet are Federal Trade Commission "Guides against deceptive pricing," "Guides against bait advertising," and "Guides against deceptive advertising of guarantees."

Manufacturers, representing an estimated \$100 million of advertising at national and local levels, have agreed upon the AHLMA code, and several of the top manufacturers have stated in no uncertain terms that they will put "teeth" in its enforcement.

Strength is added to the AHLMA program with the announcement that both NARDA and NEMA have given their approval. Close association between the code and FTC "Guides" is another strong point.

Further endorsement of the code comes from the National Retail Furniture Association, Sears, Roebuck & Co., and Montgomery Ward & Co. Advertising agencies, utilities, manufacturers, dealers and distributors have also praised AHLMA for the action.

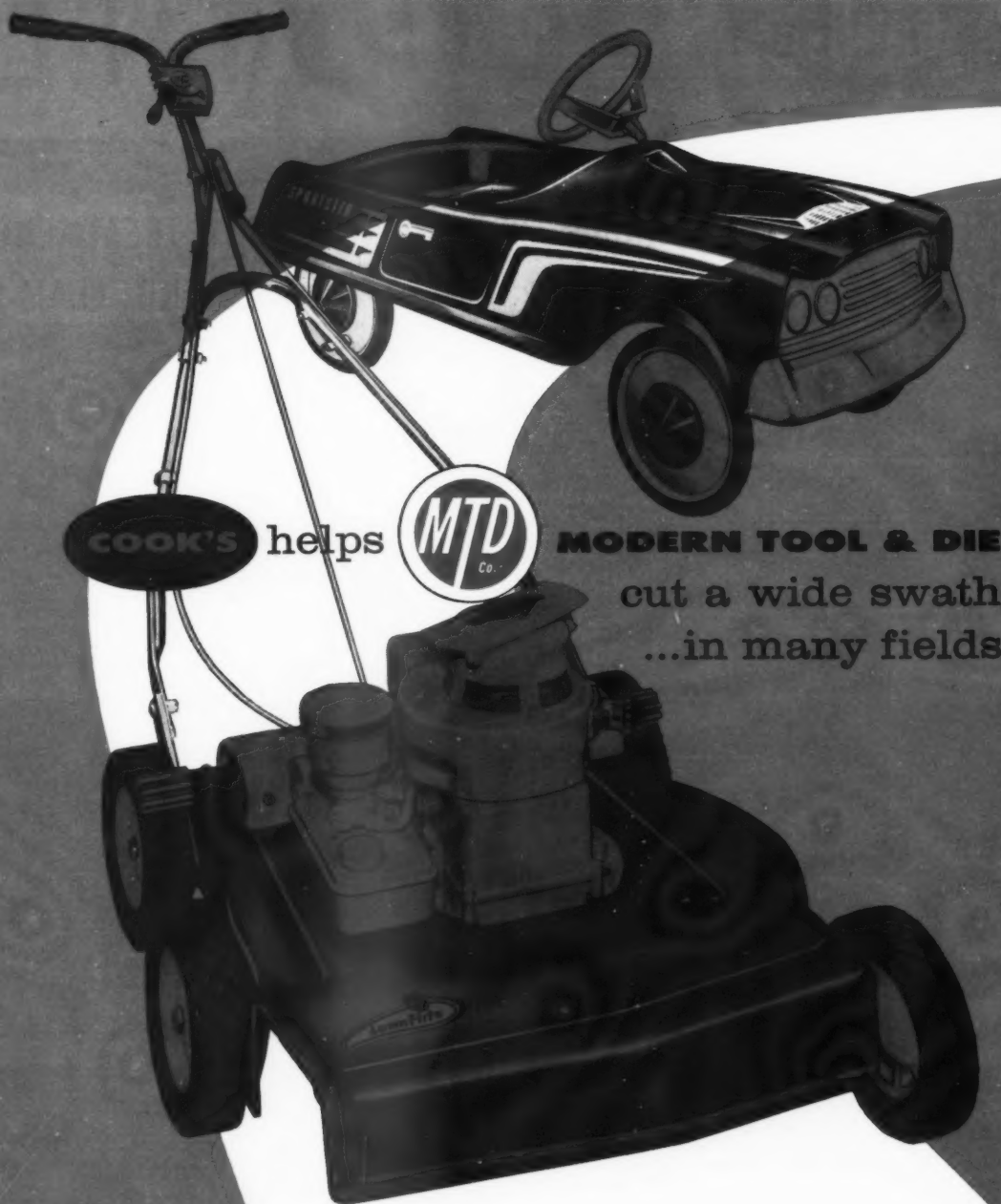
The final result, in print, of eight months cooperative effort certainly represents a constructive cooperative movement for the correction of advertising practices extremely harmful to public relations at the buyer level.

Even though 100 percent cooperation may never be obtained at all levels, this certainly represents a constructive move in the right direction toward industry self-government to eliminate requirements for government intervention.

If the new code enjoys the degree of success hoped for, it may well serve as a guide for other segments of the metal products manufacturing field.

\*More information on this code appears in the news section of this issue.





## COOK'S PAINTS

Cook Paint &  
Varnish Company  
Kansas City, Missouri

Factories: Kansas City • Detroit • Houston

*In the ever-more-competitive lawnmower business, Lawn-Flite, made by Modern Tool & Die Company of Cleveland, is one of the fastest growing favorites. And Lawn-Flite is only the newest of a whole series of toy- and garden-line successes from Modern Tool & Die.*

*Customers and trade alike will tell you that sheer **quality** is the secret of the meteoric rise of these Modern products. That outstanding quality includes the bright, clean, tough finishes.*

*Many of these finishes that resist work, wear and weather so well are supplied by Cook's—just as are the finishes that lend beauty and quality to hundreds of leading manufacturers' brands. How about your product—or products? Call on us now, to find out how Cook's can help its quality appeal—its long life—and the satisfaction of your dealers and their customers.*



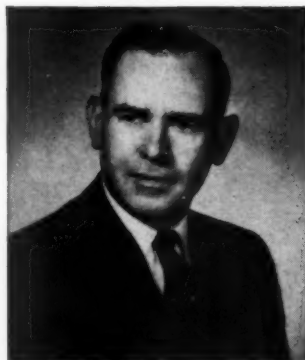
# ALODINE

10 YEAR QUALITY RECORD OF ALODINE PRE-PAINT TREATMENT  
BACKED BY ALSCO MANAGEMENT-MANUFACTURING TEAM!



## SPEAKING FOR MANAGEMENT

Ben Sugar, Alsco Vice-President Sales, on Alodine—"the foundation is the key to a successfully painted aluminum surface, and in the Alodine treatment, Alsco has found the best foundation in the industry. One of the major sales features we continually stress is Alsco's 'Six Bonds of Protection.' We consider Alodine one of the very important bonds that we use."



## SPEAKING FOR MANUFACTURING

Dale Youssi, Alsco Plant Manager at Gnadenhutten, on Alodine—"Alsco has always used Alodine as a pre-paint treatment. We find the process extremely stable, the Amchem-designed electronic controls provide substantial labor savings for our quality control people, and Alodine has enabled us to speed up production rates while retaining uniform quality. The process is certainly paying for itself. For instance, improvements made in the process equipment during the last year have already been written off."

At Alsco's impressive manufacturing facility, Amchem Alodine has played and continues to play a vital role in maintaining the world-famous quality of Alsco products.

Using the new, improved Alodine 1200S pre-paint treatment for aluminum, Alsco is racking up traceable savings in time, labor and maintenance. The increased chemical activity of Alodine 1200S can reduce processing time as much as 50 per cent. In the last year, production line speeds have been increased by 15 per cent!

Alsco quality control personnel have acclaimed the installation of the fully automated (electronically) cleaner and coating stages on both their 3-strip and 2-strip lines. Alodine 1200S

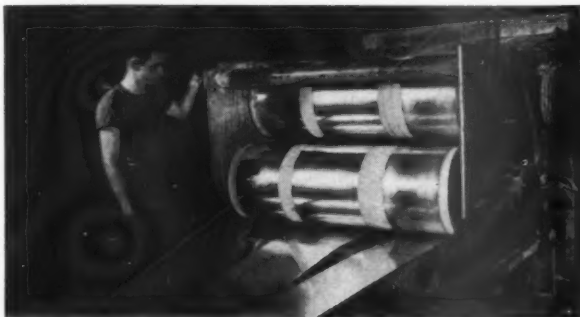
automation assures constant, uniform quality of the treated metal without constant operator attention to chemical bath maintenance.

Amchem technical assistance has been a major factor in sustaining Alsco's high quality within realistic cost structures. Continual improvements in the Alodine process have been instrumental in providing faster, better, more economical coating results!

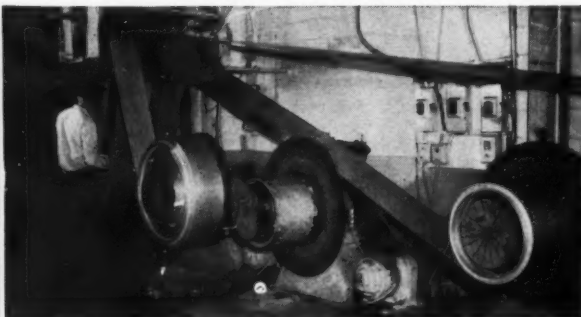
There's an Amchem Representative in your area with a pertinent story on how you can build a foundation of better quality on your aluminum products . . . with Alodine 1200S. Call our nearest representative, or write to Ambler, Pa., for complete technical details.

# AT ALSCO

## ALSCO QUALITY...FROM PRODUCTION TO PACKING



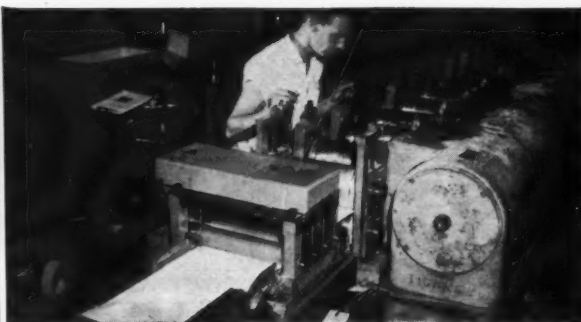
In the 3-strip metal preparation line, strip from aluminum coil is fed into Alodine processing baths where it is cleaned, rinsed, deoxidized, rinsed, coated with Alodine 1200S, rinsed, given a final acidulated rinse, then dried.



Emerging from the Alodine chemical bath treatment, aluminum strip is rewound prior to painting operation.



Alodized aluminum strip is roll-coat painted with AlSCO's Gold Bak on one side and pastel and deeptone colors on the exterior surface.



After paint is bonded to metal in temperature controlled ovens, aluminum stock is roller formed into final shape for siding.



After forming, worker turns siding over to receive Styrofoam insulation backing. (AlSCO was first siding manufacturer to Alodize both sides of strip)



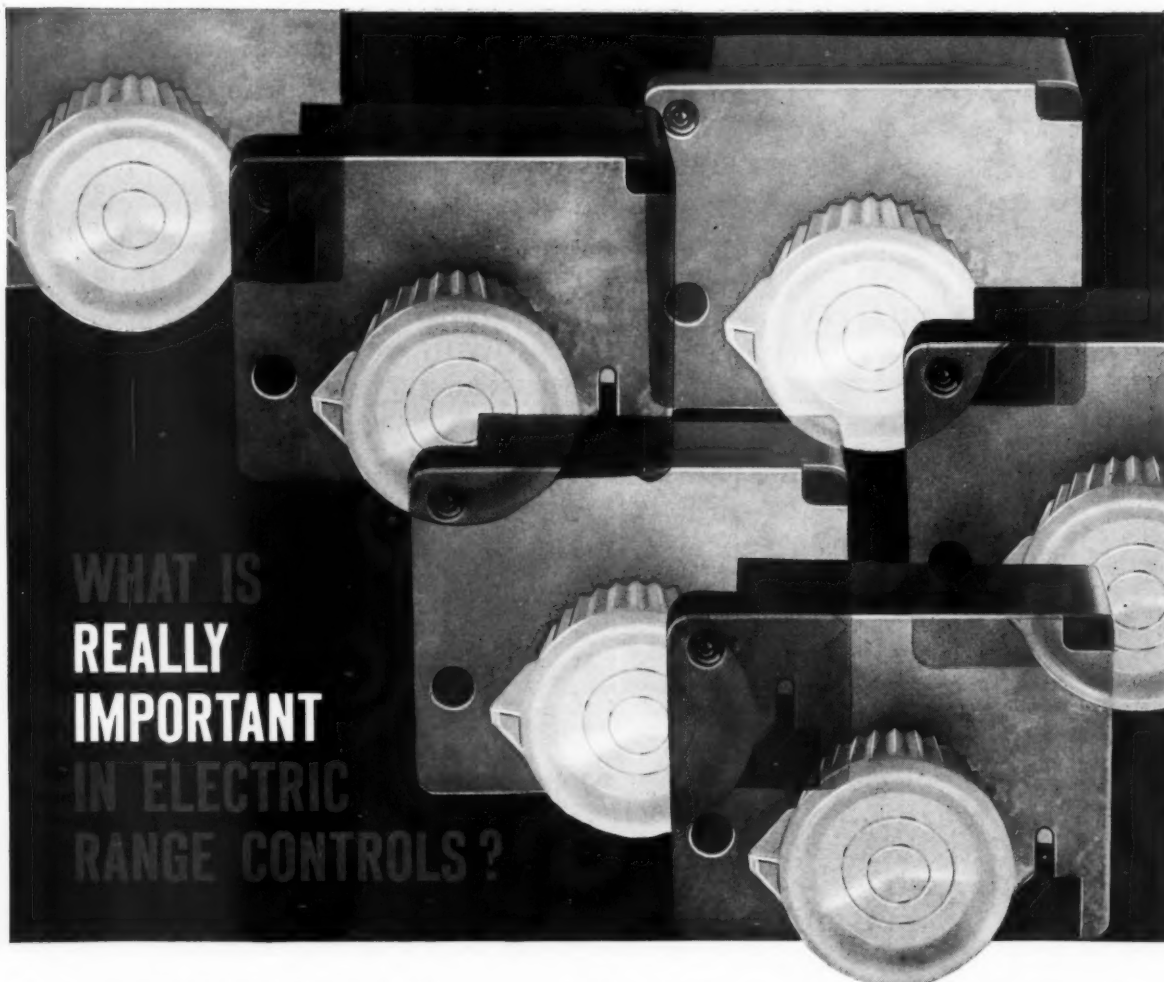
Siding is inspected prior to packing and final shipment to AlSCO dealers and distributors throughout the country.



## ALODINE 1200S

another chemical development of  
**AMCHEM PRODUCTS, INC., Ambler, Pa.**  
(Formerly American Chemical Paint Co.)

Detroit, Mich. • St. Joseph, Mo. • Niles, Calif. • Windsor, Ont. Amchem and Alodine are registered trademarks of Amchem Products, Inc.



The PROCTOR Electric Company has built and sold many millions more infinite electric range controls than any other manufacturer!

### Why?

What are the characteristics of Proctor Controls which account for this predominance?

The answer is found in a few basic features. Proctor controls are:

**SIMPLE.** There are fewer parts. There are no super-critical adjustments, no trick magnets or springs. A sturdy, simple well-designed heater and bi-metal combination does the work.

**CONVENIENT.** Proctor controls are small enough to mount easily on the most compact range, and they function well in any position. There has been no sacrifice of performance to achieve a needlessly small unit.

**STURDY.** All parts are adequately sized, strong and built to last. There are no difficult-to-meet tolerances, no too-small, stressed-to-the-limit parts, no peened or forced-to-fit terminals.

**EXACT.** The cam and all other important parts of each Proctor Control are tailored to the element. There is no compromise with quality or design in any attempt to make an "all-purpose" model with a "jack-of-all-trades" cam.

**PROVEN.** Punishing life-tests and long periods of day-to-day service in millions of homes have proven—without question—the dependability of Proctor Controls and their superiority over all other designs.

*Insist on the time-tested, proven dependability of the Proctor Range Control, the control made by the pioneers in bi-metallic range controls.*



PROCTOR VARITHERM INFINITE • PROCTOR FLASHER INFINITE •  
PROCTOR SELELECTRONIC PAN CONTROL • PROCTOR BROILATROL

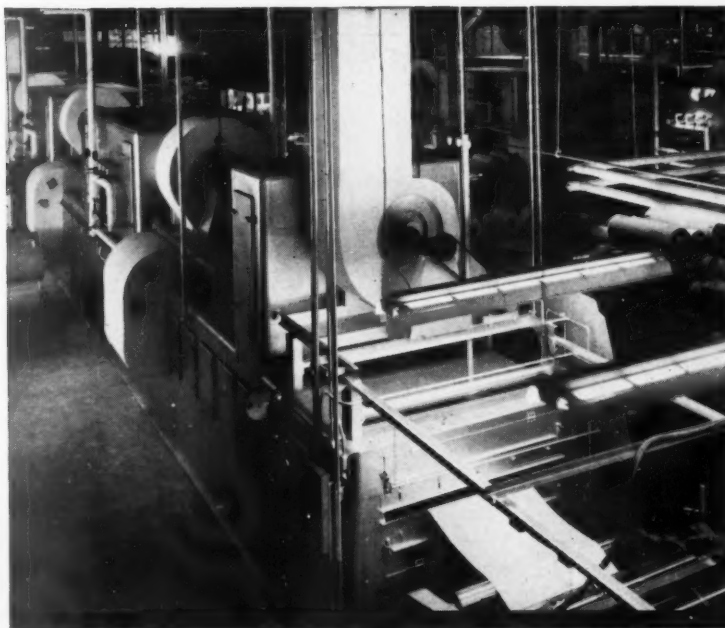
THE PROCTOR-SILEX CORP.

**PROCTOR**





*Engineered  
Atmospheres  
for Better  
Processing*



Ross Oven curing 'core stock' for a well-known cabinet top material.

# variety of ovens

*...a measure of  
engineering versatility*

The ovens listed were designed, constructed and installed by J. O. Ross Engineering during the past few months. They are selected from an extensive list of Ross Oven sales to emphasize the essential engineering quality of versatility. Anyone can design an enclosure and blow in some hot air. Speaking broadly that could be called an oven. But note the distinctly different baking or curing requirements and the temperature levels required by the different operations. It's this close temperature work that calls for skilled and experienced engineering.

The other useful bit of information that this list emphasizes is that Ross Ovens are 'custom made' for each project involved. There are so many controlling factors that it would be very impracticable to try to fit any 'standard' oven to the work.

For that oven you are planning to install, your interests would be served best by having Ross versatile skill do the design, construction and installation.



**J.O. ROSS ENGINEERING**

A Division of Midland-Ross Corporation / 730 Third Avenue, New York 17, N.Y.  
ATLANTA • BOSTON • DETROIT • SEATTLE • LOS ANGELES • MT. PROSPECT, ILL.

## 1 ...FOR STRIP COATING LINE

continuous; 3-zone oven as one element of complete Ross/Waldron Strip Coating Line (aluminum); zone temperatures 200°F, 400°F and 650°F; critical timing within zones.

## 2 ...FOR AGEING ALUMINUM


batch; featured by Ross high velocity adjustable nozzles with special spacing to assure uniform temperature throughout the oven; input air at 500°F.

## 3 ...FOR CURING WELDING RODS

continuous; 3-pass, 5-zone baking oven followed by cooling zone, totalling some 200 feet in length; zone temperatures range from 70°F to 800°F; rate of moisture removal from the flux is extremely critical and must be closely controlled in the different temperature levels; timing as well as temperature control are vitally important.

## 4 ...FOR PROCESSING SPONGE RUBBER

continuous; designed for 1, 2 or 3 zone operations; maximum temperature 450°F. Zoning to take care of (1) sag or forming, a particularly critical step; (2) blowing or foaming; (3) curing, each at different temperature levels and all 'tricky' operations; permissible variations in temperature not over  $\pm 5^\circ\text{F}$ .



Design Planning—

# MORE THAN MEETS THE EYE

Your eyes can tell you quite a few good things about the typical Kinkead extrusions and roll-formed shapes shown here.

But they cannot perceive the concentrated *design and engineering planning* which goes into products like these long before they are produced at Kinkead.

By integrating a cooperative, skilled design service with the industry's most efficient production methods, Kinkead can deliver a product functionally perfect for its application at an economical production cost.

Whether your problem is to reduce cost, simplify application, combine functions or any one of a thousand others which might be pertinent to the job you are planning, Kinkead's business is to provide the solution.

In addition to furnishing practically any type of aluminum extrusion or roll-formed shape of aluminum or stainless steel, Kinkead services also include such supplementary operations as polishing, anodizing, screen painting, bending, notching and stud welding.

For further information,  
call or write to:



**KINKEAD**  
INDUSTRIES  
INCORPORATED

5860 N. Pulaski Road, Chicago 46, Illinois  
5250 W. 102nd St., Los Angeles 45, Calif.

**T**HE MAYTAG COMPANY has cut purchased parts inventory one-third on the average, yet reduced shortage-caused production shutdowns to a negligible fraction of their former level by putting inventory control on a medium-sized electronic computer at its Newton, Iowa plants.

A smaller inventory, in addition to reducing the necessary investment, also cuts materials handling and problems connected with obsolescence, easing zeroing out. Yet it also poses the potential hazard of production shortages.

However, Maytag's experience after installing computer controls has been that shutdowns due to shortage of purchased parts have been both a great deal less frequent and considerably shorter in duration.

The new, improved inventory control system is part of the overall cost controls which have played a significant part in Maytag's higher earnings.

As one of the world's best-known manufacturers of home laundry equipment, Maytag has pioneered improvements in washing machines since the first cypress-tub model was introduced in 1907.

As MPM readers know, the company markets its appliances nationally through



PHOTOGRAPHS COURTESY INTERNATIONAL BUSINESS MACHINES CORPORATION

## Inventory control simplified with computer controls

AN EXCLUSIVE MPM FEATURE

**control of twelve hundred purchased parts handled with greater speed, lower cost, and many secondary benefits**



a vast dealer organization, with all production facilities located in central Iowa. Two manufacturing plants are at Newton, and an auxiliary plant is at Hampton, 90 miles away. It represents a highly-integrated company.

Whenever practical, Maytag starts

*(Above) — Dan Coffey, Maytag's data processing coordinator, adjusts the console of the data processing machine for the inventory control program.*

*After forecasting and production information has been read into the magnetic drum storage unit, operator inserts merged cards into the input hopper of one of two "read punch" units of the computer.*





The output cards are put through an accounting machine to print the four-part, thrice-weekly stock status report, here being checked by Arthur S. Anderson, manager of Maytag's data processing department.

with a raw material and ends with the finished product. It does, however, purchase some 1200 manufactured parts — plastic items, some die castings, timers, and many other components important to the completed appliances. It is control of these which has been improved by the use of the computer — a magnetic drum data processing machine.

#### More information by computer

Using the specific program written

for purchased parts control, the machine not only gives more information, more accurately and uniformly than ever before possible, but it also advises stock controllers when action is necessary on an item, and just what that action should be.

This is a far cry from the manual methods of the past when controllers were so heavily involved with posting that they actually had little time to analyze status of inventory levels.

Inventory control formerly was handled by what was considered a good manual system. Controllers accumulated receipts, production, repairs, shrinkage, scrap, etc., using desk calculators, then computed the balance. They had to consider every detail in building up calculations for requirements, requisitions, cancellations, rescheduling, etc.

#### Tight control for "A" parts

The tightest control was exercised on "A" parts — the 20 per cent of parts, each valued in excess of 35 cents, which make up 80 per cent of the total purchased parts inventory value. "B" and "C" parts received less control and were subject to greater inventory fluctuations.

Now, with the computer, Maytag controls 100 per cent of its purchased parts inventory. Twice a week it prepares detailed, accurate stock status reports, up-to-date as of the previous evening. Among other things, they tell exactly what is available, what is on order, and what needs special attention. A host of periodic by-product reports not compiled in the past are now possible.

As a result, Maytag has a much faster and better analysis of the inventory picture, both present and future.

#### Storage space gain

As inventory was reduced, storage space was gained. This enables Maytag to buy materials or parts in quantity when the market is right. Here again,

(Below) — A portion of the four-part, thrice-weekly stock status report, which is printed in machine shown in photo above.

INVENTORY CONTROL

FORM NO. 100-1

1

| DATE |     | PART NUMBER | REFERENCE NUMBER | CODE    | AMOUNT OF TRANSACTION | ON ORDER |        | DATE COVERED | STOCK BALANCE |              | ORDER CONTROL |     |      |             | SPECIAL ATTENTION |        |
|------|-----|-------------|------------------|---------|-----------------------|----------|--------|--------------|---------------|--------------|---------------|-----|------|-------------|-------------------|--------|
| MO.  | DAY |             |                  |         |                       | EACH     | TOTAL  |              | AMOUNT        | DATE COVERED | BANK          | VEN | LEAD | ORDER POINT |                   |        |
| 3    | 28  | 5861        | 18170            | 27 11   | 340                   |          |        |              | 396           | 39           |               |     |      | 68          | 39                | ZOSH   |
| 4    | 06  | 14803       |                  | 16 11   | 3,184                 |          | 40,000 |              | 74,832        |              |               |     |      |             |                   |        |
| 4    | 02  | 14803       | 354135           | 17 11   | 2,000                 |          | 40,000 | 25           | 74,832        | 53           | 40            | 40  | 70   | 78          |                   |        |
| 3    | 31  | 14976       | 37128            | 1 12 11 | 20,920                |          |        |              | 67,744        | 72           | 30            | 45  | 75   | 72          | 920               | RQCHPC |
| 4    | 06  | 15013       |                  | 16 11   | 712                   |          |        |              | 1,100         |              |               |     |      |             |                   |        |
| 3    | 31  | 15013       | 13265            | 22 11   | 1                     |          |        |              | 19,093        |              |               |     |      |             |                   |        |
| 4    | 03  | 15013       | 34500            | 3 12 11 | 970                   | 3,823    |        |              | 19,093        |              |               |     |      |             |                   |        |
| 4    | 01  | 15013       | 16014            | 17 11   | 23                    |          |        |              | 18,823        |              |               |     |      |             |                   |        |
| 4    | 01  | 15026       |                  | 16 11   | 1,691                 |          |        |              | 18,823        | 85           |               |     |      |             |                   |        |
| 4    | 06  | 15026       |                  | 16 11   | 1,691                 |          |        |              | 1,644         | 8            | 13            | 80  | 93   | 93          |                   |        |
| 4    | 01  | 15026       | 354137           | 17 11   | 100                   |          |        |              | 38,176        |              |               |     |      |             |                   |        |
| 4    | 02  | 15026       | 354140           | 17 11   | 150                   |          |        |              | 38,076        |              |               |     |      |             |                   |        |
| 4    | 06  | 15026       | 34580            |         |                       |          |        |              | 37,926        | 68           | 20            | 40  | 60   | 68          |                   | CH     |
| 4    | 06  | 15026       | A4731            |         |                       |          |        |              | 126,034       | 137          | 40            | 40  | 70   | 137         |                   | CHCA   |
| 4    | 02  | 15026       | A4731            |         |                       |          |        |              | 168,303       |              |               |     |      |             |                   |        |
| 3    | 31  | 15026       | 34275            | 3 12 11 | 4,050                 | 33,575   |        |              | 172,353       |              |               |     |      |             |                   |        |
| 3    | 31  | 15026       | A4731            |         |                       |          |        |              | 172,273       |              |               |     |      |             |                   |        |
| 3    | 27  | 15026       | A4731            |         |                       |          |        |              | 172,269       |              |               |     |      |             |                   |        |
| 4    | 01  | 15026       | A4731            |         |                       |          |        |              | 164,639       |              |               |     |      |             |                   |        |
| 4    | 01  | 15026       | A4731            |         |                       |          |        |              | 164,479       |              |               |     |      |             |                   |        |
| 4    | 02  | 15026       | A4731            |         |                       |          |        |              | 164,359       | 46           | 20            | 45  | 65   | 54          |                   | RQCH   |
| 3    | 31  | 15026       | K1424            |         |                       |          |        |              | 37,754        | 24           | 30            | 20  | 50   | 70          | 54                | RQ     |
| 4    | 06  | 15026       | 2-00742          |         |                       |          |        |              | 5,737         |              |               |     |      |             |                   |        |
| 3    | 31  | 15026       | 2-00742          |         |                       |          |        |              | 5,733         |              |               |     |      |             |                   |        |
| 3    | 31  | 15026       | 2-00742          |         |                       |          |        |              | 5,720         |              |               |     |      |             |                   |        |
| 3    | 31  | 15026       | 2-00742          |         |                       |          |        |              | 5,709         |              |               |     |      |             |                   |        |
| 4    | 03  | 15026       | 2-00742          |         |                       |          |        |              | 6,837         |              |               |     |      |             |                   |        |
| 4    | 02  | 15026       | 2-00742          |         |                       |          |        |              | 7,845         |              |               |     |      |             |                   |        |
| 3    | 28  | 15026       | 2-00742          |         |                       |          |        |              | 7,851         | 9            | 20            | 50  | 70   | 79          |                   | EX     |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              | 128           |              |               |     |      |             |                   |        |
| 3    | 25  | 15026       | 2-00742          |         |                       |          |        |              |               |              |               |     |      |             |                   |        |



they are achieving improved cost control. But in the past they didn't have room enough to do it.

Two controllers are needed on purchased parts. The work of these controllers has been upgraded because most of the tedious calculating now is performed by the computer.

Here is how the stock status report is prepared: card punch operators punch information from a series of source documents into cards the computer can "read." The source documents include purchase orders, receiving reports, transfers to and from repair, scrap reports, etc.

These transaction cards go through a sorter which groups them in part number sequence. They are then collated with "where used" cards, open purchase order cards, and balance forward cards. The latter cards list stock balance as of previous transaction date, quantity on order, days of production covered and control codes.

Balance forward cards for which there are no transaction cards are separated by the collator during the merging operation. They are returned to their file for future use. Production forecast cards are also punched. These include daily average requirements by model, up to six months in advance, either as additional or reduced requirements. The information from these cards, used in

DATA SHEETS USED IN THE INVENTORY CONTROL SYSTEM AT MAYTAG

| MONTHLY INVENTORY ANALYSIS PURCHASED PARTS (RECAP) |        |             |         |               |              |              |               |          |       |  |
|--|--------|-------------|---------|---------------|--------------|--------------|---------------|----------|-------|--|
| Class  | Number | Ave. Trans. | Total   | Over          | Actual       | Ideal        | Difference    | Turnover |       |  |
| Parts  | Trans. | To Date     | Accum.  | Authorization | Inventory    | Inventory    | (CR-Over)     | Actual   | Ideal |  |
|  |        |             | Trans.  | Dollars       | Dollars      | Dollars      |               |          |       |  |
| <u>Conventional</u>                                |        |             |         |               |              |              |               |          |       |  |
| A  | 48     | 226         | 10,872  | \$ 6,845      | \$1,832,931  | \$1,638,070  | \$ 194,861 CR | 9        | 12    |  |
| B  | 37     | 96          | 3,568   | 1,259         | 1,096,326    | 1,055,470    | 40,856 CR     | 7        | 13    |  |
| C  | 263    | 89          | 23,428  | 8,509         | 1,207,976    | 1,230,936    | 86,960 CR     | 4        | 7     |  |
| Total  | 348    | 108         | 37,868  | 16,613        | 4,137,233    | 3,917,476    | 319,757 CR    | 8        | 12    |  |
| <u>Automatic</u>                                   |        |             |         |               |              |              |               |          |       |  |
| A  | 64     | 255         | 14,449  | 18,218        | 1,928,428    | 1,980,612    | 52,184        | 14       | 13    |  |
| B  | 62     | 140         | 8,713   | 14,539        | 1,266,392    | 1,210,244    | 56,148 CR     | 7        | 9     |  |
| C  | 186    | 95          | 17,765  | 46,659        | 1,243,876    | 1,160,107    | 83,769 CR     | 4        | 6     |  |
| Total  | 312    | 131         | 40,927  | 79,426        | 4,438,696    | 4,350,963    | 87,733 CR     | 11       | 12    |  |
| <u>Dryer</u>                                       |        |             |         |               |              |              |               |          |       |  |
| A  | 67     | 150         | 10,068  | 139,398       | 1,590,153    | 1,524,055    | 66,098 CR     | 11       | 12    |  |
| B  | 66     | 94          | 6,260   | 20,022        | 1,106,092    | 1,076,736    | 29,356 CR     | 6        | 9     |  |
| C  | 143    | 75          | 10,823  | 26,937        | 1,088,136    | 1,048,662    | 39,474 CR     | 3        | 6     |  |
| Total  | 276    | 98          | 27,131  | 193,337       | 3,784,381    | 3,649,393    | 134,988 CR    | 9        | 11    |  |
| <u>Combination</u>                                 |        |             |         |               |              |              |               |          |       |  |
| A  | 51     | 14          | 731     | 313           | 157,110      | 108,001      | 49,109 CR     | 1        | 3     |  |
| B  | 51     | 10          | 554     | 701           | 107,909      | 101,033      | 6,876 CR      | 1        | 2     |  |
| C  | 132    | 6           | 920     | 978           | 104,768      | 100,921      | 3,847 CR      | 1        | 1     |  |
| Total  | 234    | 9           | 2,205   | 1,992         | 369,787      | 109,955      | 59,832 CR     | 1        | 2     |  |
| TOTALS   | 1,170  | 93          | 108,131 | \$291,368     | \$12,730,097 | \$12,127,544 | \$ 602,510 CR | 9        | 12    |  |

MONTHLY INVENTORY ANALYSIS (DETAIL)

| Part Class Number | Date          | Count | Receipts | USAGE      |        |       |         | DOLLAR VALUE |       |       | TURNOVER |       | Over Auth. \$ |
|-------------------|---------------|-------|----------|------------|--------|-------|---------|--------------|-------|-------|----------|-------|---------------|
|                   |               |       |          | Production | Repair | Scrap | Shrink  | Actual       | Ideal | Diff. | Actual   | Ideal |               |
| C                 | 2-909 12-31   | 177   | 598,727  | 368,144    | 75,454 |       | 130,660 | 534          | 753   | 219   | 11       | 8     |               |
| C                 | 2-11087 12-31 | 92    | 48,237   | 32,685     | 696    | 1     | 6,599   | 46           | 53    | 7     | 6        | 6     |               |
| C                 | 2-11166 12-31 | 12    | 5,100    | 232        |        |       | 4       | 143          | 24    | -119  | 5        | 5     | \$ 26         |
| A                 | 3-11322 12-31 | 63    | 5,554    | 3,678      |        | 33    | 475     | 1847         | 324   | -1523 | 2        | 12    | \$2,947       |
| B                 | 4-10140 12-31 | 15    | 1,941    | 116        |        |       | 111     | 134          | 20    | -114  | 1        | 9     |               |

(1) This is self explanatory except for some of the abbreviations.  
(2) Class of part - A, B, or C.  
(3) Count - Count of Transactions during the month for each item.  
(4) Actual inventory is compared to the ideal level and difference is noted - all in dollars.  
(5) Over Auth. - This column tells how many dollars are over the amount authorized for each part.

The machine applies transaction, production and forecast information to the stock balance cards, computes it, and punches a series of output cards which an operator removes from the "read punch" unit.



computing production days covered, is read into the magnetic drum storage unit of the data processing machine.

Stock status report

The stock status report is prepared each Monday and Thursday. However, on Monday only, all of the balance forward cards are run through the machine to reduce balances by the amount of the previous week's production. This is accomplished by punching cards for the amount of each current model made and feeding this information, too, into the drum.

Then, when the merged deck goes through, the "where used" automatically select the models on which each part is used, accumulate total usage and deduct that amount from the stock balance.

The computer then applies the forecast information and information from the various transaction cards to the affected balance cards, computes it, and punches a series of output cards.

These cards are put through an accounting machine to print the four-part stock status report. Included on it are: date, part number, reference number,



*Typical parts bins in warehouse.*

unit measure, source code, transaction quantity, on order each, or order total, on order coverage (production days), stock balance, stock balance coverage (production days), bank (production days), vendor lead (production days), order point (production days, determined by adding stock-balance coverage and on-order coverage).

In addition, the report includes a "special attention" column in which codes are listed. These include: EX — stock balance is less than one-half of bank and expediting is in order; RQ — total coverage is less than order point, and a requisition should be made up; CH — stock balance is more than two times the bank and cut-back on deliver-

ies should be considered, etc. The meanings of these and the several other codes used are listed on the pre-printed report, alongside the special attention column.

Copies of the stock status report go to inventory control and production control departments at Plants 1 and 2. One inventory control copy is a hectograph master used to post transactions and totals to stock control cards. The other is the copy for stock controllers.

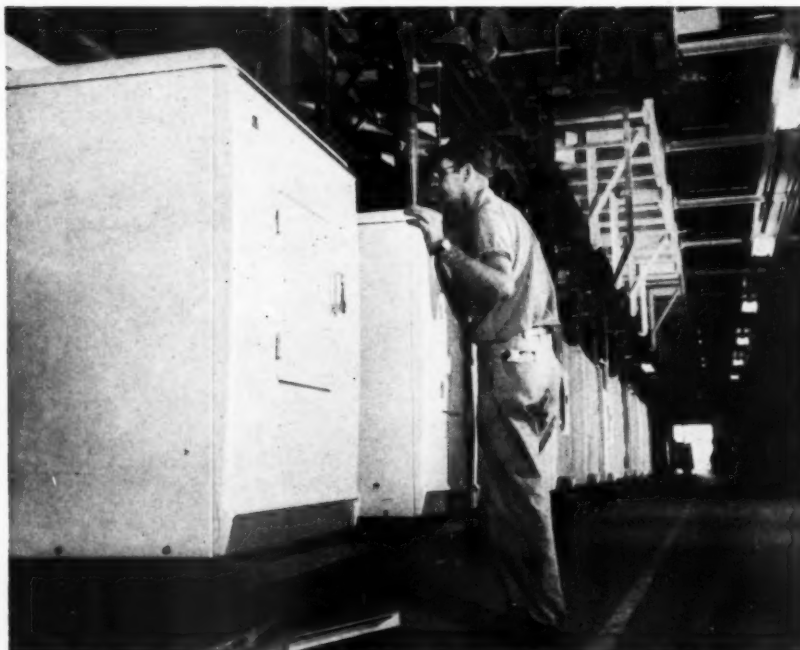
#### **Editing minimized**

With this detailed report, for all practical purposes the controllers need only edit the special attention column. This gives a degree of uniformity never possible before when one controller approached a problem in one way, and another in a different way. Now the computer makes the routine decisions along with the calculations.

The machine also gives a variety of extremely valuable reports on purchased parts inventory. These include: monthly inventory analysis recap; monthly inventory analysis detail; gains and losses; reject, disposition and shipping order; receiving report sequence; purchase order closed; and shrink report and variance check, comparing physical inventory with record inventory.

In essence, the computer supplies more information to responsible people in less time than ever before. Recently, this enabled Maytag to rapidly procure enough parts when production was more than doubled on one model. It has also made it possible to set up exact, workable dates whenever new models or specification changes occur and to balance out obsolete parts.

*View of dryer production line at Maytag.*



Tables used in the inventory control system at Maytag, but not shown in this article, are listed as follows:

#### **GAINS AND LOSSES OF PURCHASED PARTS**

This report is for production managers and cost accountants.

#### **REJECT, DISPOSITION, AND SHIPPING ORDER REPORT**

Only good parts available for usage are in the stock balance figures. The disposition report is a record of the manner in which a rejected item is disposed of. The shipping order is used in most cases because the parts are usually sent back to the vendor. All three must balance out.

#### **RECEIVING REPORT SEQUENCE LISTING**

The purpose of this report is to check duplicate or missing receiving reports.

#### **PURCHASE ORDER CLOSED REPORT**

This report helps to notify the buyer and the receiving clerks of all orders that are closed.

#### **SHRINK REPORT**

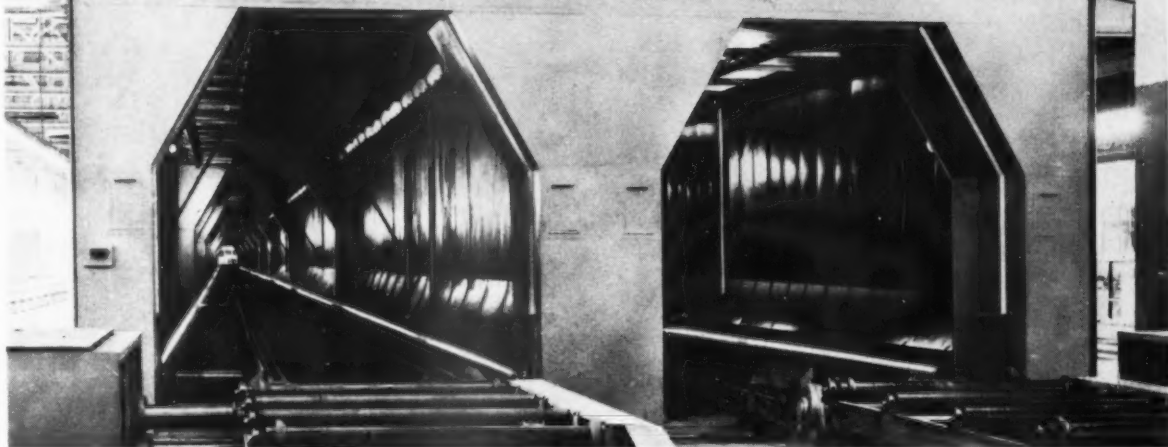
All pilferage, losses, and damaged but not reported parts fall in this category.

#### **VARIANCE CHECK**

The purpose of this report is to pinpoint those items that require the first check.



## The CHRYSLER Finish *has to be good...*



Entrance of the two 900 foot Burdett ovens in the Chrysler Plant, showing the continuous line of Burdett 10-L Burners along each side.

## BURDETT FINISHING SYSTEMS *do the JOB!*

Chrysler ("America's Best Built Automobile") is a quality car throughout, and its good looks must be far more than skin deep. Its brilliant finish must *endure*. That's why Chrysler uses the Burdett Finishing System. Burdett Radiant Heat actually "welds" the finish to the metal;

it's there to stay, and what's more the Burdett 10-L Radiant Heat Burners save 30% to 70% in heat processing costs, compared with conventional methods. Operation temperature at refractory maintained at approximately 2300 F. with only a radiant glow and no flames discernible.



# BURDETT

**MANUFACTURING COMPANY** • 4920 SOUTH MONITOR AVENUE CHICAGO 38, ILLINOIS  
COMPLETE FINISHING SYSTEMS FEATURING RADIANT HEAT COMBUSTION

Whether you need a complete finishing system, an addition to your present layout or the renovating of your old system, Burdett engineers can help you. Write today.



## RESEARCH

Practically all of the advances in surface treatments for metals have come from the big, ingenious Parker research staff. This consultation is on a new treatment for hot dip galvanized.

## DEVELOPMENT

An improved Parker product for use in laminating plastic to metal undergoes checks and tests in the development lab. Parker products are carried from test tube to production line by Development.



## Here's why the are Parker's conversion

Start with the experience and knowledge of the field which has built the Parker line. Our restless search for new ways and better ways to protect metals and increase finish durability has been continuous for almost fifty years, and has produced practically every major advance in the science.

Add Parker's free engineering service. Our staff engineers have designed literally thousands of practical, money-saving surface treating installations. This no-charge service includes detailed drawings and specifications—complete data ready for you to turn over to equipment builders for bids.

## FIELD SERVICE

The Parker field service representative, stationed near you, averages 14¾ years of experience in the conversion coating field.



## TESTING

A corner of the testing labs, with the photomicrograph camera in use. Facilities include salt spray and humidity test rooms, outdoor exposure fields, equipment for all accepted testing procedures.



## SERVICE LABS

Customer Service Labs take your materials, treat them in Parker's \$¼-million production line equipment, test the results obtained. Photo shows stock scheduled for 125'-long strip Bonderite machine.



# biggest bargains in the business coatings for your products

Consider the qualifications of the Parker man who lives nearby and serves you. Our technical representatives have an average of 14¾ years of experience, equipping them to work with you and help you. They're practical, service-minded men, who bring understanding, ingenuity and dedication to you and your plant.

Back in Detroit, there are some 45 men working for you. These are our research and development people, manning the largest research program in the surface treatment field. Their discoveries of new processes, improvements and refinements are tested, proven, and passed on to you for your profit.

A \$¼-million investment on your behalf is the production line Customer Service Lab. It's organized as an extension of your research and development program. Here we take your materials and treat them on a production line basis to work out the proper processing procedure, set time cycles, solve a cleaning problem, prepare material for experimental manufacture in your plant. All without charge.

For the low cost of the Parker chemical alone, you get this complete package of service and satisfaction. *It's the biggest bargain in the business.*

**Parker Rust Proof Company**  
2170 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base • BONDERITE and BONDERLUBE aids in cold forming of metals • PARCO COMPOUND rust resistant • PARCO LUBRITE—wear resistant for friction surfaces • TROPICAL—heavy duty maintenance paints since 1883

\*Bonderite, Bonderized, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.





## Plant addition triples Harvestore production capacity

*Storage area for finished Harvestore sections. From here, the sections are "sequence packaged" on shipping skids.*

**automated finishing equipment included in new A. O. Smith facility**

### AN MPM STAFF FEATURE

A NEW 164,000-SQ.-FT. plant addition has been completed at A. O. Smith's Harvestore Products Div. The addition will triple production of "glass protected steel" bulk storage systems for industry and agriculture.

Not to be confused with the traditional farmer's silo, the Harvestore is an all-steel unit, glass coated inside and out, and sealed to keep out oxygen which causes spoilage. It is loaded from the top and mechanically unloaded from the bottom, permitting progressive processing of several crops. Pushbutton cattle feeding is possible with the use of motorized unloaders and conveyors.

The Harvestore and its counterpart, called Permaglas mechanized storage

unit, has equally important applications in industry. Among the many bulk materials that are "warehoused" in the mechanized storage systems are starch, wood flour, sugar, grain, soy beans and plastics.

The structures are assembled from 57 x 108½ inch glass coated steel sheets which are bolted together with lap-joint seal. The units are available in diameters of 14, 17 and 20 feet and a range of 10 to 50 foot heights.

Production of the sheets in the quality and quantity necessary requires precise, carefully controlled manufacturing techniques. And all phases of Harvestore and Permaglas storage units production — cleaning, forming, finishing,

handling, packaging and shipping — meet these requirements. In addition, a complex control system provides a constant vigilance in each step of the automated operations.

### Production sequence

Incoming "raw" steel sheets are placed in a storage area where they are handled with a 10-ton bridge crane in bundles weighing five to six tons. Gauges used in Harvestore production run from .104 (3/32) to .197 (3/16).

When the sheets are ready to be used, they are moved to a roller conveyor for shot blasting. After the sheets are shot blasted they are coated with a rust preventive, restacked in bundles, and con-

veyed to the new manufacturing area. Here the bundles are temporarily placed in the "clean" storage area prior to the beginning of production.

Seventy holes are pierced simultaneously on the outer edges of the sheet on a 450-ton eccentric press. The holes are 9/16 inch in diameter. Some sheets require holes in addition to the outer-perimeter holes, and another die must be used. The sheets are fed individually into the press with a vacuum-cup lifting device.

A 10-ton bridge crane transfers the pierced sheets, in bundles of 18 to 106, to a short roller conveyor. Here the sheets are individually de-stacked and fed into a unique "true-circle" vertical roller. The sheet is drawn through two pinch rollers and past a steel, wedge-shaped shoe which forms the 8½-foot radius. Formed sheets are checked once an hour to make certain the correct radius is being maintained.

The sheet is then placed on a jack and lifted to overhead hooks on the spray conveyor line. This is part of the nearly 3,000 feet of conveyor used in the plant.

The first step in the surface preparation is a vertical washer, where the sheets are sprayed with gas-heated 200° F. caustic water under high pressure. Each sheet remains in the washer four to five minutes and goes through two washing cycles and one 180° F. rinse.

Prior to the application of the first coat of "glass," the sheets are etched by a steel grit blaster. The sheet stops as it enters the grit-blasting booth, and ten grit nozzles on each side of the sheet perform a uniform blasting operation which takes about 55 seconds. Each of the two batteries of nozzles is mounted on tracks which are curved to conform with the contour of the sheet.

As the nozzles travel the length of the sheet on the tracks, they also move in a vertical rocking motion to insure even distribution of the blasting grit.

The grit is reclaimed automatically from the bottom of the booth; particles that become too fine for efficient blasting are automatically removed from the reclaiming conveyor by a suction action. About 150 pounds of new grit is added each day to maintain the proper quantity and consistency of grit. Following the blasting, a powerful, automatic air spray removes all remaining grit from the sheets and the conveyor hangers.

After the blasting and air spraying is completed, the conveyor carries the sheet to a spray booth for the application of the first coat of slip. Again the conveyor stops, and a track-mounted spray nozzle assembly on each side of the sheet applies a light ground coat. Both sides are coated simultaneously. Since the sheets are still warm from the grit blasting, only a 100° F. drying operation is required.

Following the first coat spraying and drying, the sheet continues to the next spray booth. The application of the second coat is also performed by means of the curved track principle, with one exception: because the air turbulence created by two nozzles spraying at the same time would make the application of a perfectly even coat difficult, only one side is sprayed at a time.

The slip is circulated continuously in a pipe from an agitated tank, and is tapped off the circulating line through

*Albers Milling Co., Jefferson, Wis., manufacturer of dog food, uses eight Harvestore automatic bulk materials handling systems for storage and conveying of whole and cracked wheat and soft ingredients that go into the formula.*

a pressure regulator to provide uniform discharge of slip at the nozzle. The spray booth is designed with down-draft ventilation to reclaim overspray. The slip is piped from the two-level mill

*Shot blasted sheets are fed into 450-ton eccentric-type press with a vacuum-cup lifting device. The press pierces 70 holes on the outer perimeter of the sheet.*



#### PLANT FACTS

**PILOT PRODUCTION STARTED:** January 18, 1960

**INCREASE IN PRODUCTION CAPACITY:** approximately 300 percent

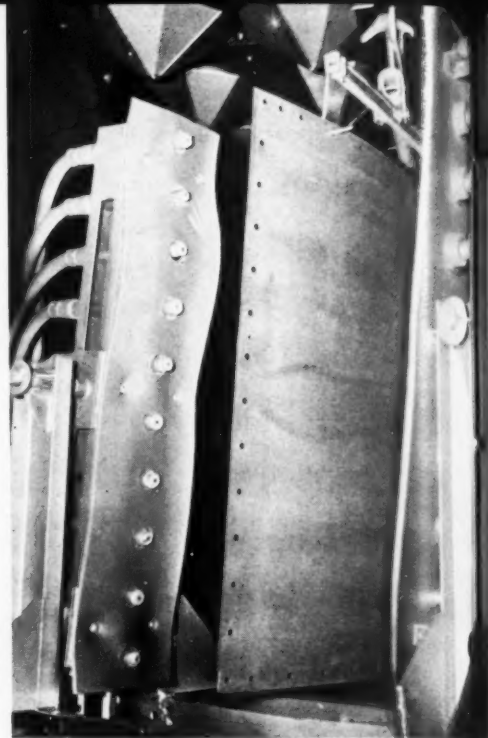
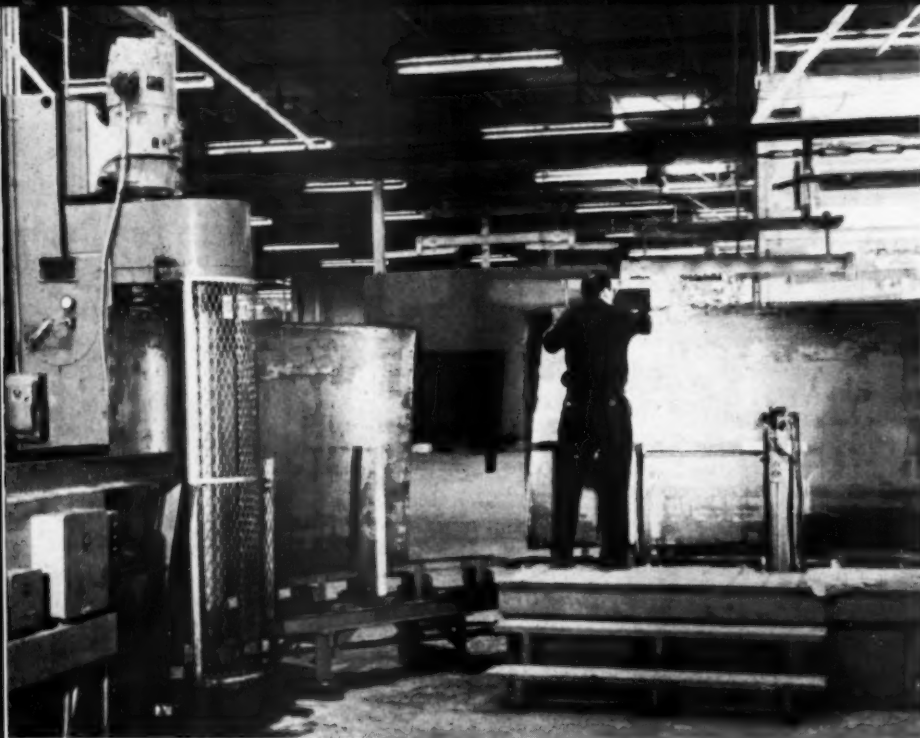
**PLANT SIZE:** 164,000 sq. ft. of floor space

**PLANT COST:** approximately \$2,100,000 (building and equipment)

**CONSTRUCTION:** walls are concrete slab to a height of 16 feet with insulated aluminum upper walls up to the built-up roof

**HEATING AND AIR CONDITIONING:** oil-fired heating equipment, ceiling mounted — air is maintained under slight pressure with one-fourth fresh air make-up





room through overhead pipes to the circulating system agitated supply tank.

The cover coat is dried at 250° F. in a gas-fired convection drier. The ten-minute drying operation is carried out while the sheets make three passes through a figure "S" drier.

After leaving the drier, a code number is stenciled on a corner of the sheet. This number identifies the gauge of the steel, the work shift, and the date the sheet was run.

Bisque thickness is usually held within a range of .012 — .014 inch. Every sheet is checked for defects by production employees, and a spot inspection of

bisque thickness is made once an hour by quality control personnel.

#### **Transfer to furnace conveyor**

At this point the sheets are transferred either to the storage line or the furnace conveyor line for firing of the glass. The transfer is accomplished by means of a manual hook device. If the spray line is temporarily shut down or a sheet is rejected from the line, bisque-coated sheets are taken from the storage conveyor and placed on the furnace conveyor. In this way the furnace is fed at a constant rate.

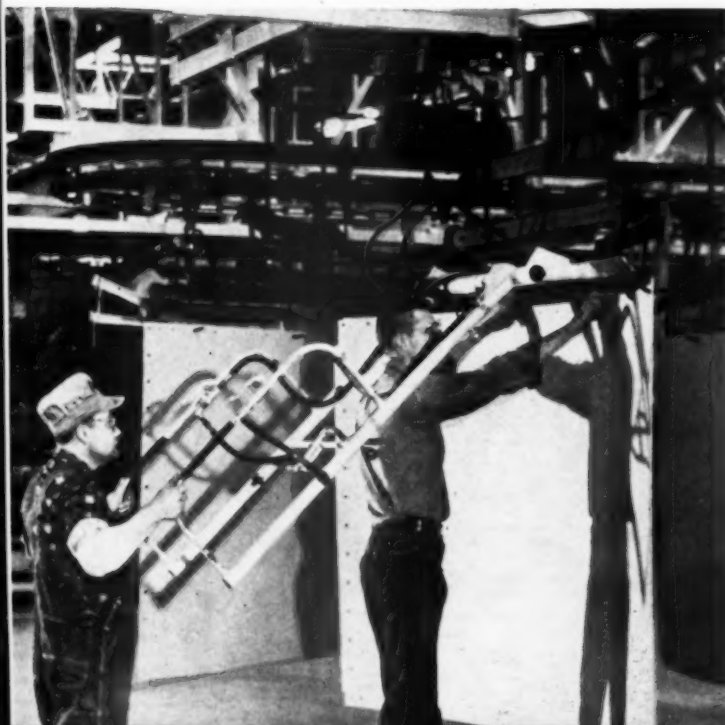
The storage conveyor line is loaded

near the point where the sheets are transferred from the spray line to the furnace line. Up to 30 sheets can be stored, which is enough for approximately 45 minutes production.

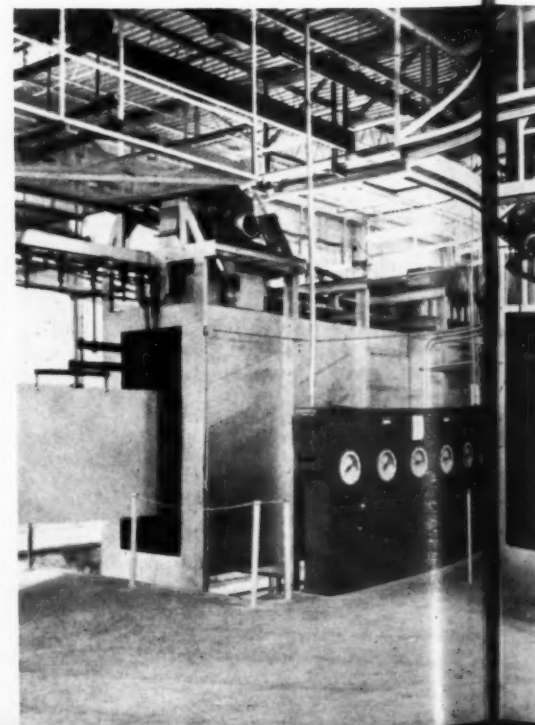
The storage conveyor can also act as a "safety valve"—if the furnace conveyor line is shut down temporarily, sheets coming off the spray line can be held on the storage line until the furnace line resumes operation.

#### **Radiant-tube furnace**

The radiant-tube, continuous-type firing furnace consists of three heating zones and three cooling zones. Vertical



*(Left) — Following a ten-minute drying operation at 250° F. in a figure "S" drying booth, the sheets are transferred to the furnace conveyor line. A sheet is shown being hung on the line with a manual transferring device. Some sheets are placed on a storage conveyor line at this point.*





(Far left) — After piercing, sheets are formed to an 8½-foot radius with a "true-circle" vertical roll (left). The sheet passes through two pinch rolls and is drawn past a wedge-shaped steel shoe, which forms it to its proper radius.

(Left) — Following a 200° F. caustic water wash, the sheet enters this grit-blasting booth where the surface is etched in preparation for the first coat of slip. One of the two batteries of steel grit nozzles is seen at left. The nozzles travel the length of the sheet on tracks conforming to the contour of the sheet to achieve uniform blasting. While moving laterally, each battery of nozzles also rocks back and forth in a vertical motion.

(Right) — Application of the cover coat is performed one side at a time to avoid uneven distribution of slip. Two spray guns operating simultaneously would create air turbulence that would make a uniform coating difficult. Spraying unit travels on curved track so distance from nozzles and sheet remains constant.



temperature control is provided by dividing each of the three heating zones into two vertical zones. Control is accomplished by both the location of the dimples in the radiant tubes and by their method of firing.

The first of the gas-fired heating zones is a 25-foot section which heats the sheets to approximately 1250° F. The next 25-foot section increases the temperature to approximately 1520° F., and the final 25-foot zone heats at a reduced temperature of about 1440° F.

Next is a refractory-lined pre-cooling zone employing controlled dew point air, followed by a 50-foot water-jacketed cooling section where the temperature of the sheet is dropped from 1000° F. to approximately 400° F. Water temperature in this zone is automatically controlled for uniform cooling. The final cooling zone is a 130-foot air-blast section which reduces the temperature of the ware to 100° F. The fired sheets emerge from the cooling zone at this safe handling temperature and they are

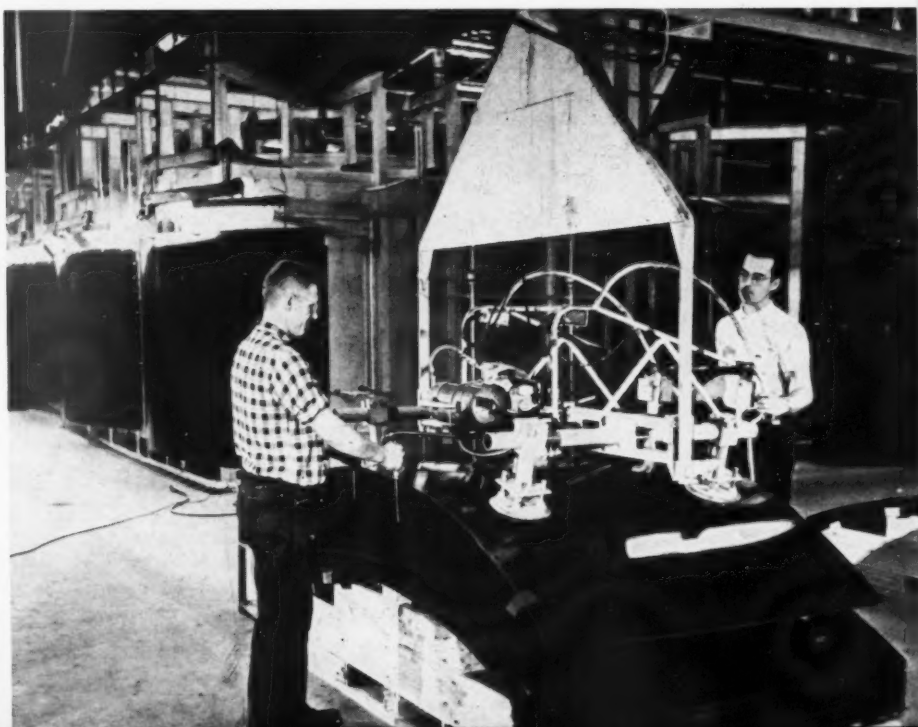
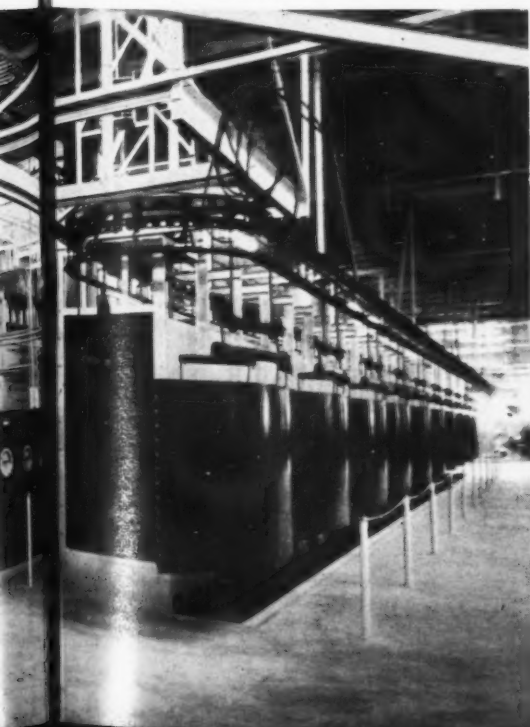
air cooled further as they move the length of the furnace to the inspection area.

The 280-foot furnace has a heating capacity of 24 million Btu and consumes 24,000 cu. ft. of gas per hour when operating at full capacity. It utilizes 140 alloy radiant tubes. Forty-five sheets are fired per hour.

An interesting feature of the furnace is a series of electric eye units which are installed along the entire length of the furnace. Placed in the lower portion

(Below, center) — Curved sections enter the U-type furnace at left. As they emerge from opening at right, they travel the length of the furnace to the brightly lighted inspection station

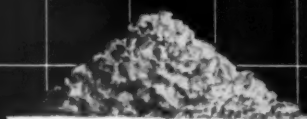
at the extreme right. Note recording equipment for six zones. (Below, right) — Sheets are removed from furnace conveyor line with a suction-cup unloader and placed on wooden skids.



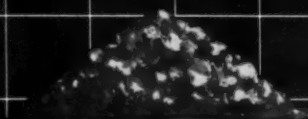


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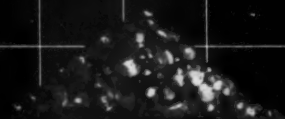
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Rod Bush, manufacturing superintendent, Harvestore Products Div., checks master control panel for a station-by-station picture of the finishing lines.

of the furnace wall cooling zone, the "eyes" detect any sheet which might fall from the conveyor and, in such an event, the line is automatically stopped.

Prior to unloading the fired sheets from the conveyor, production employees examine each sheet for uniformity of finish and glass thickness. In addition, quality control personnel make a detailed inspection of five sheets each hour.

Following this final inspection, the sheets are removed from the conveyor with a specially designed suction-cup unloader and stacked on skids. The skids are transported to a temporary storage area by means of a 10-ton bridge crane. Any rejected sheets are returned by power truck to the beginning of the line for reworking.

#### Electric control system

The key to the smoothly timed operation of the two lines (spraying and firing) is an electronic control system that moves each line in 80-second cycles — the spray line has a dwell time of 55 to 60 seconds at each of the work stations, and 20 to 25 seconds are allowed for conveyor movement. The firing line cycle consists of 35 seconds of conveyor movement and 45 seconds dwell time. Thus the two lines are synchronized on 80-second cycles, allowing the lines to operate in unison.

Here is how the system works: During the 55 to 60-second dwell time on

the spray line, all operations are being performed — a formed sheet is being hung on the conveyor, sheets are being washed in the vertical washer (and others are being dried), the grit blaster is preparing the surface of a sheet for the application of the first coat of slip, another sheet is being dried, the second coat is being applied to a dry sheet, and a completely sprayed sheet is being dried. During this same dwell time, a sheet is being transferred from the spray line to the furnace line.

The dwell time on the furnace line also allows the unloading of finished sheets at the end of the line.

When the dwell time is completed, a loud buzzer and control panel indicator lights signal the conveyor movement, and the sheets move on to their subsequent work station.

If trouble develops at any of the stations, the source of the difficulty is shown on the master control panel in the form of a red light, and movement of the conveyor is delayed until the difficulty is corrected. All of the stations are equipped with control buttons which allow an employee to stop the line if an emergency arises.

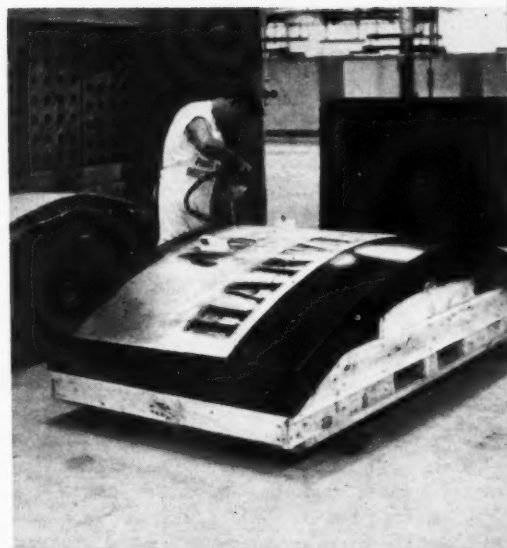
A duplicate master control panel is suspended from the ceiling of the plant so that progress of the line can be observed from almost any point in the building.

#### Identification

Each complete storage unit is identified as an A. O. Smith Harvestore or Permaglas product in large, white fired-on-glass letters. The customer also has the option of any lettering he wishes.

The lettering is applied to a finished

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(Top, right) — "A. O. Smith Corporation — Harvestore" is stenciled on one section of every complete unit. White porcelain enamel is applied through large rubber stencil with hand spray gun.

(Center right) — After spraying, letters are carefully outlined by hand and the sheets are then refired.

(Right) — Stenciled sections after firing. Sheets in background have been lettered to each customer's order.





## New Dole ice maker features "dry-cold" ejection

AN MPM STAFF REPORT

WHEN DEVELOPMENT was started on the new Dole ice maker (Dole engineers refer to it as an "ice cuber"), a number of basic principles were laid down as requirements for the product. Among these were the following:

1. It must work satisfactorily in a refrigerator or freezer, under all conditions, including wide ranges of water types.
2. It must be well adapted to modern refrigerator designs, and be flexible with respect to mounting position; i.e., right hand, left hand, or center mounting.
3. It must also be designed for absolute minimum space requirements, and easy installation.
4. The cost must be within the realm of practical marketability.
5. It must have a very high order of reliability and be easily serviced.
6. It must have a low electrical power demand and release minimum quantities of heat into the freezer compartment.
7. The resulting ice cubes must be clean and dry and free from shattering.

Early research indicated that a dry release type of cuber would be the most practical, and the cuber developed is a "twist tray" release type. A very substantial amount of fundamental research was necessary to establish a sound understanding of ice adhesion. This work was done in the company's research laboratories and in university research programs established by the company for this purpose.

The Dole ice maker is designed around the plastic twist tray which is supported on either end in bearings on mounting plates. The tray is made of linear polyethylene and has 12 cavities. An electric gear motor is used for the drive. An analog thermostat, "brain" of the unit, is used to initiate and control the cycle. Water enters the tray through a metering valve with a built-in flow control. The flexible orifice automatic

flow control used in this valve establishes a constant rate of flow, independent of supply pressure. A cam-operated sweep arm senses the level of cubes in the ice bin. An outline of the components for the ice maker is as follows: (1) twist tray, (2) drive mechanism, (3) ice storage level sensing mechanism, (4) water control valve for time fill, (5) front cover for drive mechanism, (6) analog thermostat, and (7) mounting structure. The single solenoid water metering valve with automatic flow control and a mounting bracket is included as part of the package, but is physically separate from the main unit and is designed for remote installation, outside of the freezer compartment.

The following is a description of the operating cycle: Starting with the tray filled with water, freezing occurs. The analog thermostat, which resets at a rate

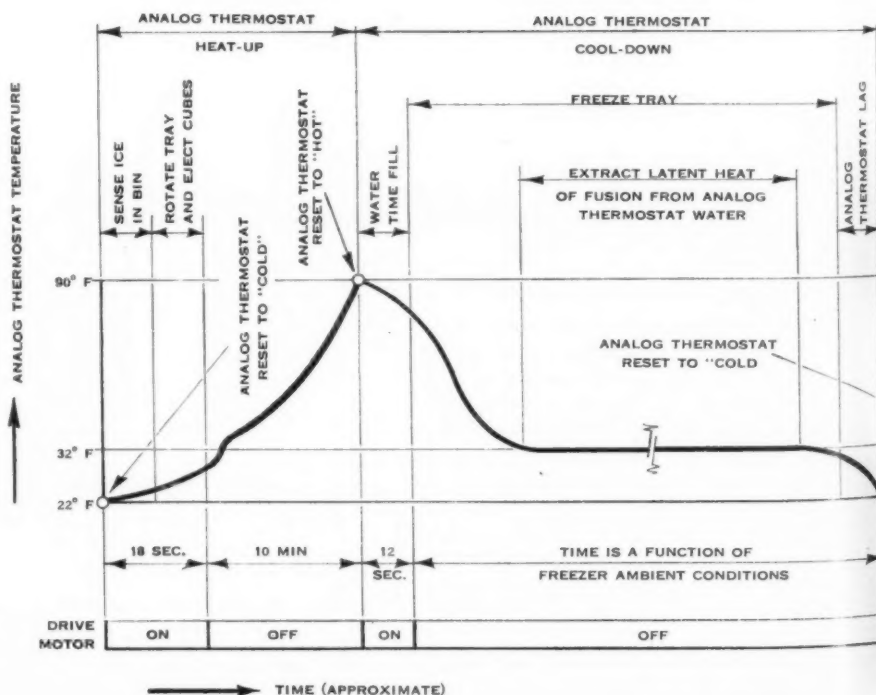


MPM PHOTO

Robert G. Voigtmann, product development supervisor of the Special Products Group, holds a complete analog thermostat (right hand) and in the other hand the brass tank for the thermostat. The small "seeding tube" can be seen extending from the end of the tank. On the table are completed units and units in process.

analogous to the freezing of the water in the tray, resets to the "cold" position, energizing the analog heater and the drive motor. The drive motor then actuates a cam which operates the sensing arm which, in turn, senses the level of the ice in the storage bin. If the storage level has reached a predetermined height, the sensing arm opens a switch and shuts off the unit until the ice is removed; if the ice level is not up to the

### DOLE ICE MAKER MODEL III ANALOG THERMOSTAT CYCLE





predetermined level, the sensing arm returns to the normal "up" position, and the plastic tray slowly inverts.

When the back end of the tray has reached approximately 125° of rotation from its original position, a stop is encountered on the back mounting plate which prevents additional rotation of the back end of the tray. The front end of the tray then rotates an additional 20°, which is sufficient to eject the cubes into the storage bin.

Following the ejection of the ice cubes, the tray is released from the driving mechanism and is returned to its normal horizontal position by a torsion spring. The drive motor turns itself off, and the analog thermostat continues to heat up.

When the ice in the analog thermostat has been melted by the heater the, thermostat resets to the "hot" position, the analog heater is de-energized and the drive motor is started. After the motor gets up to speed, a cam cuts in the solenoid inlet water valve and the tray is filled. The length of the segment of the cam which controls the water valve switch, combined with the automatic flow control in the valve, determines the volume of water used in filling the tray.

Section of the test room in which the ice cube automatic units are being tested for various functional characteristics. Here H. T. Sathe, test engineer, is measuring torque versus degrees of tray twist while ejecting ice. The refrigerator at right is open (for photographic purposes) to show the actual test, and a plastic front required for the test has been removed. The equipment at left is an oscillograph recorder.

MPM PHOTO



This recording potentiometer records all of the reset temperatures of the analog thermostat and the freezer unit temperature (freezer interior). Typical information recorded on a single unit by a 12-point recorder and carefully placed thermocouples includes fan on-and-off point, compressor on-and-off point, and room ambient.

MPM PHOTO

After the water valve is electrically turned off, the motor automatically cuts out and the cool-down starts in both the analog thermostat and the ice tray.

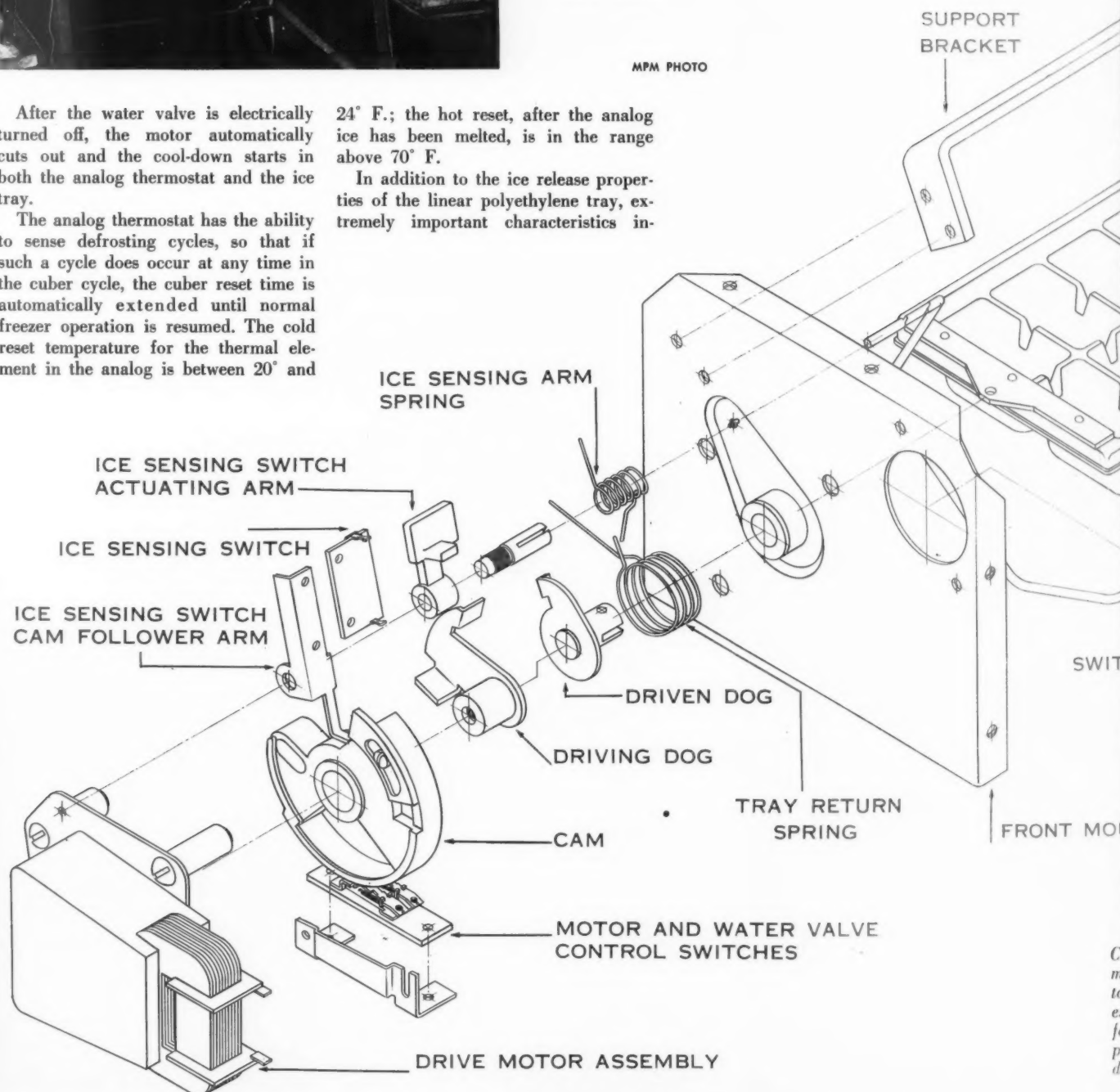
The analog thermostat has the ability to sense defrosting cycles, so that if such a cycle does occur at any time in the cuber cycle, the cuber reset time is automatically extended until normal freezer operation is resumed. The cold reset temperature for the thermal element in the analog is between 20° and

24° F.; the hot reset, after the analog ice has been melted, is in the range above 70° F.

In addition to the ice release properties of the linear polyethylene tray, extremely important characteristics in-

clude its flexibility and long life under flexing at low temperatures.

As designed, the tray has a bracket riveted to each end to prevent the ends of the tray from distorting. The bearings that support the tray ends are mounted to these end brackets by pivot (forming what might be called "whiffletree"). The purpose of the pivot is to permit the tray to distort free without creating undue stresses



SWITCH

FRONT MOUNTING

Chamber temperature for period

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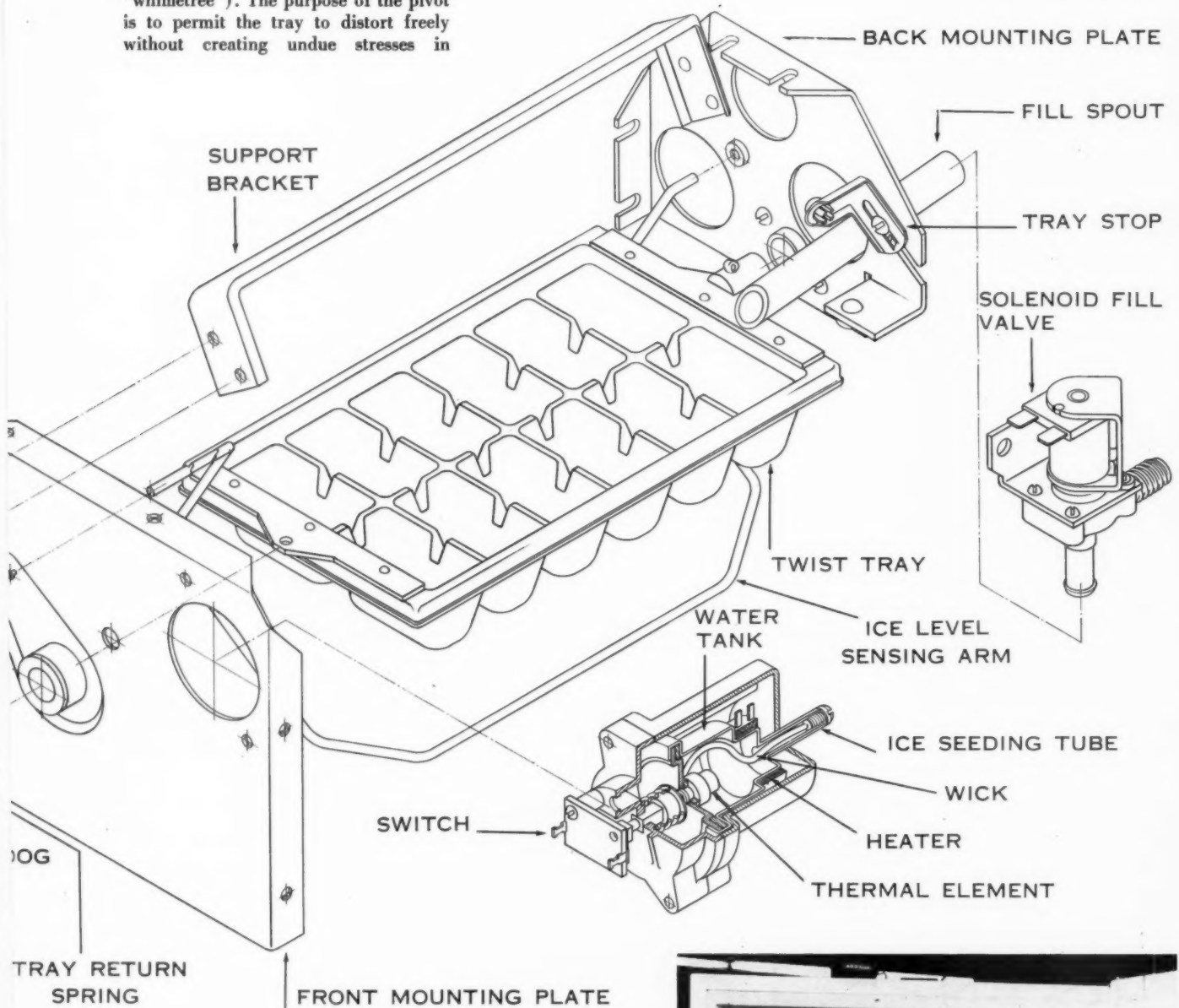
corners; in addition, the twist is obtained with a minimum torque by this method.

Further, the back end of the tray is supported in a bearing that provides for free axial movement, so that as the tray foreshortens as a result of twisting,

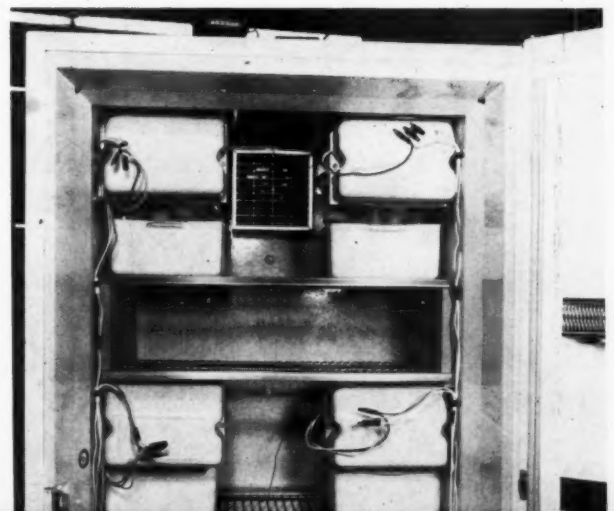
the rear support shaft has freedom of movement axially.

The tray drive mechanism consists of a driving dog and a driven dog mounted on different centers. The driving dog picks up the driven dog with

to Page 42 →



*Checking functional performance of the ice maker. Automatic counters and all necessary equipment are used for conducting a general performance test under standard refrigerator operating conditions.*





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# THE DOLE VALVE COMPANY

One of the best known products of The Dole Valve Co. is the "Citation" Coca-Cola dispenser, which is seen on thousands of soda fountain counters all over the world. (See feature article on this dispenser in the February, 1959 issue of MPM.) A new "Director" dispenser has now been developed for The Coca-Cola Company. The dispenser has its own refrigeration unit and provides for continuous dispensing of three different beverages from the same machine.

The company is a principal supplier of automatic controls for the home appliance industry, the automotive industry, the plumbing and heating field, and the fountain beverage dispenser industry. The engineering development programs required for these products were instrumental in leading Dole into a similar program on ice makers for domestic refrigerators.

The principal plant of the firm, and its corporate headquarters, are located in Morton Grove, Ill., with a total floor space of approximately 300,000 sq. ft.

| A TYPICAL CYCLE  |   |   |   |                     |   |
|--|---|---|---|---------------------|---|
| TIME   | ICE TRAY  | ANALOG  | MOTOR                                     | FILL VALVE          | ICE SENSING ARM   |
| -  | Water frozen, Temperature falling                                   | Water frozen, temperature falling   | Off                                       | Closed              | Up  |
|  | Water frozen, temperature falling                                   | Ice in analog reaches 22°F., thermostat senses 22° F. and resets to "Cold" position; turns on motor for ejection cycle; energizes heater in analog to melt ice (in preparation for next cycle). | Off<br>↓<br>On                            | Closed              | Up  |
| 18 Sec.<br>↑<br>↓  | Starts rotation   | Heater melting ice in analog  | Run                                       | Closed              | Drops to sense ice storage level; if bin not full, returns to "Up" position. If bin is full, arm switch suspends cycle. |
|  | Twists and releases, ejecting ice to storage bin                    | Heater melting ice in analog  | Completes ejection run, shuts off         | Closed              | Up  |
| Approx. 10 Min.<br>↑<br>↓  | Upright, empty  | Heater completes melting of analog ice; thermostat resets to "Hot" position, turns off heater, energizes motor for time-fill cycle.   | Off<br>↓<br>Run                           | Closed<br>↓<br>Open | Up  |
| 12 Sec.<br>↑<br>↓  | Upright, filling with water   | Water in analog starts cool-down  | Run; shuts off when time fill is complete | Open for time fill  | Up  |
| Tray freezing time dependent on freezer ambient conditions<br>↑<br>↓ | Upright, Filled, cooling down                                       | Continues cool-down   | off                                       | closed              | Up  |
|  | Reaches 32° F.; freezing starts                                     | Reaches 32° F.; freezing starts   | Off                                       | Closed              | Up.   |
|  | Freezes, at 32° F., by extraction of latent heat of fusion in water | Freezes, at 32° F., by extraction of latent heat of fusion in water   | Off                                       | Closed              | Up  |
|  | Ice frozen, resumes temperature fall down from 32°F.                | Ice frozen, resumes temperature fall down from 32°F.  | Off                                       | Closed              | Up  |
|  | Frozen solid  | Ice reaches 22°F., thermostat senses and initiates ejection cycle   | Off                                       | Closed              | Up  |

[illegible]

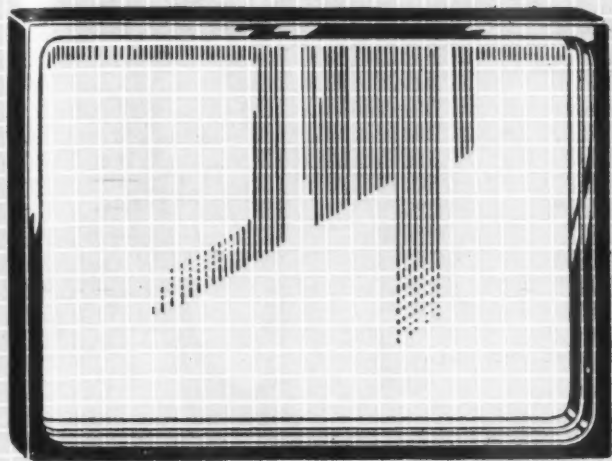
Tests show that, at a typical rate of ice production (harvest rate), the heat gain attributable to the ice maker itself is less than ten Btu's per hour. This, of course, does not include the heat which is in the water used to fill the tray for each cycle. The only heat introduced into the freezer space is that contributed by the drive motor, and the heater used to melt the water in the miniature "heat sink" in the analog thermostat.

Another major problem in designing the unit was to determine when the ice was frozen and ready to be ejected. This could not be done satisfactorily by a conventional thermostat. The rate of freezing depends upon the individual characteristics and operating conditions of the cabinet, and the time required

On the basis of our market research and the products now available, we feel that an ice maker will be on 50 per cent of the total production of the household refrigeration industry within three years from the release date for the new equipment.

A black and white photograph of two men in an office. The man on the left is seated at a desk, wearing glasses, a light-colored shirt, and a dark tie. He is looking towards the camera. The man on the right is standing, also wearing a light-colored shirt and a dark tie, and is holding a large folder or book. He is looking towards the camera. A typewriter is visible on the desk between them. The background consists of dark vertical blinds and a light-colored curtain on the right.

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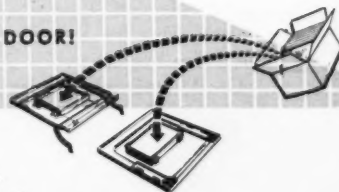


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into your DOOR!



## MILLS PRODUCTS INCORPORATED

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**P**ERSISTENT DEMANDS FOR STAINLESS steel electric coffee percolators led Landers, Frary & Clark, New Britain, Conn., producers of this type of appliance to introduce an entirely new "Coffeematic," using 18-8 stainless steel for body, cover and components.

In finished form, the body is eight inches deep with a 4½ inch inner diameter just above the bottom step. Diameter is expanded in a slight straight taper for about six inches and then is belled out to 5¼ inches at the bead. This shape is excellent from appearance and utility standpoints, but involves many production operations whose total cost is considerable.

Offsetting factors are fine finished appearance and high corrosion resistance, strength and stiffness that make for long life and excellent service without plating or other applied finish. Stainless steel used, both for the body and for the lid, is of the No. 302 (18-8) type of 0.025-inch initial thickness.

Fastened to the body, with a solder that matches the stainless body in color, is a stainless steel no-drip spout of neat design, whose sloping lower contour is slightly curved.

About ¼ inch from the bottom, the body has a narrow step against which a bottom cup or cover for the heating and control element seats. This cover is a drawn cup of cold rolled steel that, prior to assembly, is plated with copper, nickel, and chromium after suitable polishing and buffing. This yields an enduring finish that is a close match with the stainless steel body.

An outward bead separates the upper and lower portions of the cup, and the recess between the bead and the step in the body is largely covered by an anodized aluminum band showing the name of the unit — the familiar loop design used on Universal utensils — and some other markings.



*Universal "Coffeematic" as it now appears in the stainless steel model. The unit was designed by Sundberg-Ferar.*

## Design innovations of stainless coffeemaker

*by Paul J. Kircher* • CHIEF PRODUCT ENGINEER, HEATING AND COOKING APPLIANCES, LANDERS, FRARY & CLARK

**bell-shaped body, no-drip spout, heat guard handle promote convenience, good looks**

The crowned cup that forms the lid or cover is 302 stainless of 0.025-inch thickness. A bead next to the crown seats against the bead at the top of the body and joins a deep cylindrical extension. This fits between the bead and the coffee basket.

Good external appearance is enhanced by the use of three black phenolic moldings. One of these is a ring

forming a base on which the bottom cup rests and is fastened. This ring has shallow domed feet and forms a good heat insulator between portions above and any surface on which the base rests. A looped "heat-guard" handle, having a flange that fits the stainless body, is the second molding. At the center of the top is the third molding, a knob having its upper end shaped similar to a wedge.

Of particular interest from an electrical and heat transfer standpoint is the use of the steel-clad heating unit. It replaces the conventional heater composed of resistance wire wound on mica used in earlier percolators and affords extremely rapid heat transfer. In making the heater units, nichrome wire is wound into a helix and is inserted axially into a steel tube. Space between the



coil and the tube and inside the coil is filled with magnesium oxide powder.

After the steel tube is filled, it is bent to form a three turn helix whose inner diameter is a close fit on the outer diameter of a brass well to which the unit then is silver brazed. When current is applied, the heat generated is conducted rapidly to the steel sheath and thence to the wall of the brass well. This insures equally rapid transfer of heat to the fluid in the well, as desired for rapid percolation.

With this new type of heating unit, now replacing the former type in all percolators made by Landers, Frary & Clark (including those having copper bodies), there is relatively small loss in radiated heat because it is so rapidly conducted to the well wall and thence to the water in the well.

Fastened to the bottom of the body is a thermostat assembly, the helical 600-watt heating unit, portions of the well and 60-watt open heating coil designed to keep a percolated brew hot indefinitely after the main heater has cut out. A bi-metal thermostatic element is designed to open when the entire brew has reached temperature (normally about 200° F.), this being adjusted by screw settings in fairly conventional manner.

Percolation starts, however, soon after plugging in and when the water is only slightly warmed. By the time the whole batch (which can be from four to ten cups total) is up to the set temperature, however, the brew is completed and contacts open automatically, breaking the main heater circuit. Should the plug be inserted without first adding water, temperature will rise rapidly and the thermostat will cut out at the set temperature, without adverse effects upon the unit.

Means are provided for setting the thermostat so that the brewing will cease automatically at any point from "mild" to "strong" by merely moving a knob attached to a lever projecting through a slot in the base cap. Motion of this lever sets the contact adjusting screw so that contacts open earlier for mild brew or later for a stronger brew. As soon as the main contacts open, the small heater coil for keeping the brew hot is energized. It applies only enough heat to make up for radiation losses and does not affect the brew except to keep it hot.

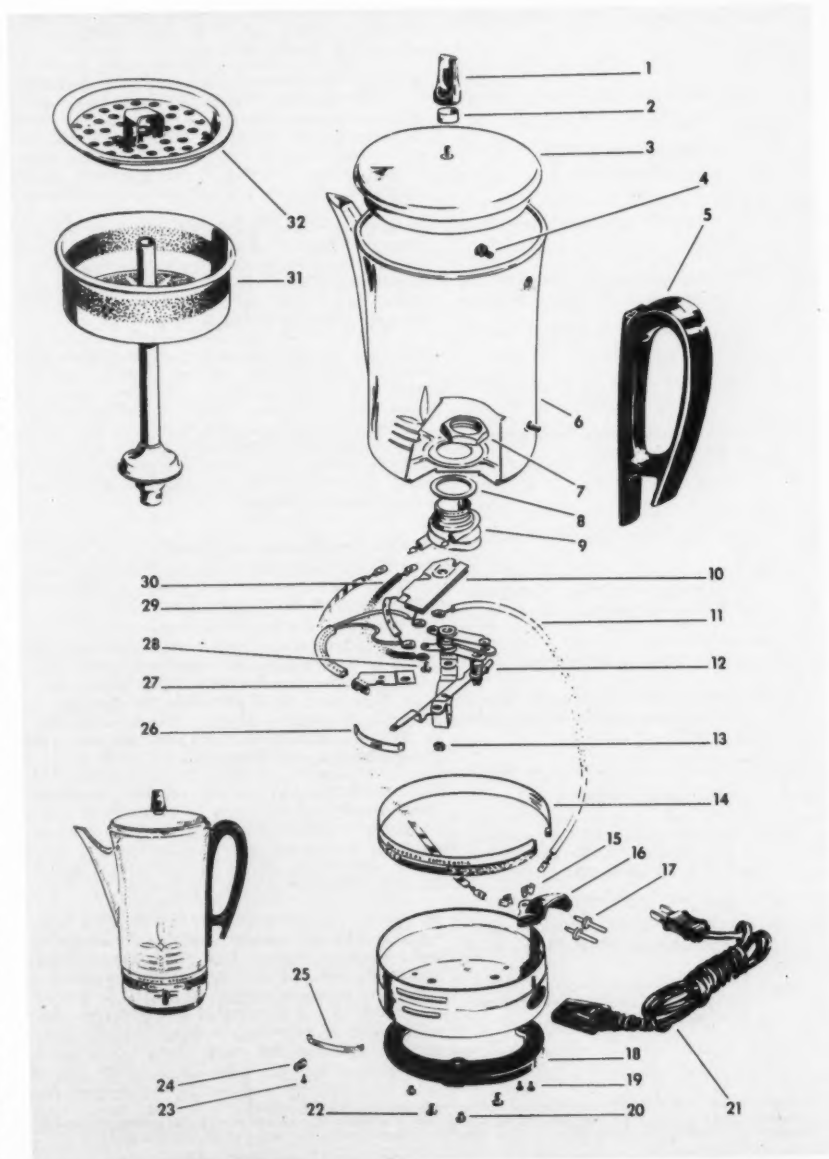
Design of the stainless percolator parallels in many respects the models having copper bodies in a variety of finishes, but the shapes of the stainless parts differ not only for appearance reasons but to adapt them to ready produc-

tion. Both material and production costs for the stainless product exceed those for the top model in the copper line (that includes three chromium plated

models) and dictates a slightly higher retail price, but improved production methods are now being studied to reduce this differential.

#### COMPONENT LIST AND EXPLODED VIEW OF UNIVERSAL COFFEEMATIC

|       |                                   |    |   |
|-------|-----------------------------------|----|---|
| 1-3   | Cover Assy.                       | 17 | Connection Stud                             |
| 1     | Cover, Knob, Black                | 18 | Sub-Base, Black                             |
| 2     | Cover Knob Trim                   | 19 | Rivet                                       |
| 3     | Cover                             | 20 | Eyelet                                      |
| 4     | Handle Screw and Washer           | 21 | Cord  |
| 5     | Handle, Black                     | 22 | Screws, 6-32x3/16 Pan Hd. Steel Chr. Pl.    |
| 6-9   | Body w/Heating Unit, Nut & Washer | 23 | Screw, 4-40x1/4 Rd. Hd. Steel, Ni. Pl.      |
| 6     | Body                              | 24 | Adjusting Knob                              |
| 7     | Heater Nut                        | 25 | Jewel                                       |
| 8     | Well Washer                       | 26 | Adjusting Lever Shield                      |
| 9     | Heating Unit                      | 27 | Lamp Bracket                                |
| 10    | Neon Lamp and Warning Unit Assy.  | 28 | Screw, 6-32x1/4 Bd. Hd. Steel Ni. Pl.       |
| 11    | Lead Wire — Control to Conn. Stud | 29 | Lead Wire — Heating Unit to Connection Stud |
| 12    | Control Assy.                     | 30 | Lead Wire — Control to Heating Unit         |
| 13    | Nut, 8-32x5/16 Hex x 7/16 Ni. Pl. | 31 | Inset                                       |
| 14-20 | Base Assy.                        | 32 | Spreader Plate                              |
| 14    | Base Trim                         |    |   |
| 15-17 | Conn. Stud and Guard Assy.        |    |   |
| 15    | Connection Stud Clip              |    |   |
| 16    | Conn. Stud Guard, Black           |    |   |



**Table 1 — Nominal Composition and Application of Wrought Non-Heat Treatable Alloys of Aluminum**

| Alloys | Descriptions   | Applications   |
|--------|--|--|
| EC     | Available as: Sheet, Plate, Wire, Conductor, Redraw Rod.<br><br>Nominal Chemical Composition: 99.45% Minimum aluminum. | An alloy with a specified minimum of 99.45% aluminum developed especially for Electrical Conductor use.  |
| 1100   | Available as: Sheet, Plate, Rod, Wire, Forging Stock.<br><br>Nominal Chemical Composition: 99% Minimum aluminum.       | "Commercially pure aluminum" with a minimum specified aluminum content of 99%. Excellent for sheet metal work, spun hollow ware, decorative finishes. Gives a light color after anodizing. Outstanding workability. Often used for parts requiring repeated working. Readily welded and brazed by all methods. Highly resistant to corrosion.  |
| 3003   | Available as: Sheet*, Plate*, Rod, Wire.<br><br>Nominal Chemical Composition: † Manganese 1.2%.                        | Used for chemical equipment, tanks, pots and pans. Addition of manganese increases strength about 20% over 1100. Excellent workability, weldability. 3003 is general purpose alloy for moderate strength applications — has high resistance to corrosion.  |
| 3004   | Available as: Sheet*, Plate*.<br><br>Nominal Chemical Composition: † Manganese 1.2%, Magnesium 1.0%.                   | Special sheet metal items where combination of moderate formability and fairly high strength is desired, e.g., shoe eyelets, lamp bulb bases, etc. Alloying additions give strength midway between 3003 and 5052 but with some reduction in workability. Good resistance to corrosion.   |
| 5050   | Available as: Sheet*, Plate*, Rod, Wire.<br><br>Nominal Chemical Composition: † Magnesium 1.4%.                        | Selected for appliances, utensils, building materials, irrigation pipe. Considerably stronger than 3003 and particularly noted for its relatively high yield strength after forming. Excellent weldability and resistance to corrosion. One of the best finishing alloys — gives a comparatively clear white appearance after etching and after anodizing.   |
| 5052   | Available as: Sheet, Plate, Rod, Wire.<br><br>Nominal Chemical Composition: † Magnesium 2.5%, Chromium 0.25%.          | Transportation uses, sheet metal parts, home appliances, chemical drums. Strongest non-heat-treatable sheet and plate alloy in common usage. Good workability. Tough — has excellent resistance to salt water corrosion. Good weldability but may require careful techniques.  |
| 5005   | Available as: Sheet, Plate.<br><br>Nominal Chemical Composition: † Magnesium 0.8%.                                     | Has good corrosion resistance, approximately the same strength as 3003 and forms easily. Unlike other high magnesium alloys, it does not have the usual dark coloration. 5005 is well suited for anodizing applications since it exhibits less tendency toward structural streaking. After anodizing 5005 is clearer and lighter in color than either 3003 or 5052. It is particularly desirable for architectural applications. |
| 5056   | Available as: Rod, Wire.<br><br>Nominal Chemical Composition: † Magnesium 5.2%, Manganese 0.1%, Chromium 0.1%.         | A high strength alloy used chiefly in the form of wire for screen, various types of fasteners and cable coverings. Screen wire usually clad for extra protection against corrosion.  |
| 5357   | Available as: Sheet, Plate.<br><br>Nominal Chemical Composition: † Manganese .30%, Magnesium 1.00%.                    | A magnesium alloy which, when anodized, is better suited for decorative applications than any other commercially available aluminum alloy. This alloy lends itself favorably to chemical or electro-brightening process. Anodized finishes in 5357 are extremely bright and compare with chrome plate and stainless steel.   |
| 5083   | Available as: Plate.<br><br>Nominal Chemical Composition: Magnesium 4.45%, Manganese 0.8%, Chromium 0.1%.              | Designed for welded structures requiring maximum joint strength and efficiency combined with light-weight and corrosion resistance. Uses include marine superstructures, decks and hulls, automobile frames and aircraft landing gears, structural towers for TV, drilling rigs, trusses and girders.  |
| 5086   | Available as: Sheet, Plate.<br><br>Nominal Chemical Composition: † Magnesium 4.0%, Manganese .45%, Chromium .10%.      | A high strength common alloy having good forming properties with excellent welding characteristics and corrosion resistance. It is available in annealed and rolled tempers. In the annealed condition, 5086 has a tensile strength about 40% greater than 5052. This fact, together with its property of weldability, is expected to make this alloy especially attractive for many types of welded assemblies.                 |

† Per cent of alloying elements—aluminum and normal impurities constitute the remainder.

\* Sheet and plate in these alloys may be obtained in clad form for particular applications where extreme protection against corrosion is necessary. The properties of the clad material are approximately the same as those of the base.

## Fabricating

by Lester F. Spencer

### PART I PRESS WORKING

THE CONTINUAL GROWTH in the use of aluminum base alloys for consumer products can be attributed to a number of favorable properties, among which would include: (a) the weight advantage, this material being about 1/3 the weight of steel; (b) the ability to obtain a variety of strength-ductility combinations through the medium of either cold-rolled tempers, or by heat treatment; (c) favorable electrical conductivity which, when compared weight for weight, is better than any commercial metal; (d) the ability of high reflectivity to the common forms of radiant energy — light, radiant heat, and both radio and radar waves; (e) the high thermal conductivity which makes it applicable where heat transfer is important; and (f) corrosion resistance of many of these alloys to atmosphere and many chemical environments.

#### Aluminum alloy types

The strength of the non-heat-treatable alloys, the nominal composition, availability, and applications being given in Table 1, is dependent upon the degree of cold work given to the annealed sheet. As the temper increases, the strength of the alloy will increase with an accompanied decrease in ductility and, as a result, will also be associated with decreased formability. It should be realized that the properties obtained through cold working are dissipated by heat, such as annealing, and they cannot be restored except by additional cold work.

The heat-treatable alloys, the nominal compositions and applications being given in Table 2, contains certain elements that have solid solubility at elevated temperatures, and of limited solubility at lower temperatures. Their high strength is obtained through the medium of heat treatment and, although it is beyond the scope of this article to discuss this phase, it can be stated that two distinct operations are involved, namely: (a) a high temperature heating followed by a drastic quench, its function permitting the solid solution

# the aluminum base alloys

METALLURGICAL ENGINEER

of the alloying elements; and, (b) an elevated temperatures permitting a pre-aging treatment at room or slightly- cipitation of the alloying elements in

**Table 2—Nominal Composition and Applications of Wrought Heat Treatable Alloys of Aluminum**

| Alloys | Descriptions  | Applications  |
|--------|---|---|
| 2011   | Available as: Bar, Rod, Wire.<br>Nominal Chemical Composition:†<br>Copper 5.5%, Lead 0.5%, Bismuth 0.5%.  | 2011 is a free machining alloy used mainly for screw machine products. Has excellent machinability, fairly high strength.   |
| 2014   | Available as: Clad Sheet and Plate, Wire, Rod, Forging Stock, Extrusions.<br>Nominal Chemical Composition:†<br>Copper 4.4%, Magnesium 0.4%, Silicon 0.6%, Manganese 0.8%.       | Recommended for structural members in aircraft and transportation equipment. One of the most widely used forging alloys. Excellent for resistance or spot welding. 2014 is not generally fusion welded because of reduced strength and corrosion resistance at the weld.  |
| 2017   | Available as: Bar, Rod, Wire, Forging Stock.<br>Nominal Chemical Composition:†<br>Copper 4.0%, Magnesium 0.5%, Manganese 0.5%.  | Structural parts, screw machine products. Has good machinability, moderate to high strength.  |
| 2218   | Available as: Forging Stock.<br>Nominal Chemical Composition:†<br>Copper 4.0%, Magnesium 0.6%, Nickel 2.0%.   | Engine pistons and parts that require hardness and good strength at elevated temperatures.  |
| 2024   | Available as: Bare or Clad Sheet and Plate, Bar, Rod, Wire, Extrusions.<br>Nominal Chemical Composition:†<br>Copper 4.5%, Manganese 0.6%, Magnesium 1.5%.                       | Standard sheet alloy for aircraft construction. Also used for truck wheels, etc. Similar to 2014 in behavior and strength. Sheet and Plate usually clad for superior corrosion resistance. May be spot welded.  |
| 6061   | Available as: Bare or Clad Sheet, Plate, Rod, Wire, Forging Stock, Extrusions.<br>Nominal Chemical Composition:†<br>Magnesium 1.0%, Silicon 0.6%, Chromium 0.25%, Copper 0.25%. | Transportation, structural, pipe, furniture applications. Least expensive, most versatile of heat-treatable group — only heat-treatable alloy that is readily fusion welded. Will take considerable forming in — T4 temper. Good resistance to corrosion. Sheet sometimes clad for superior appearance and /or additional corrosion protection.     |
| 6062   | Available as: Extrusions.<br>Nominal Chemical Composition:†<br>Magnesium 1.0%, Silicon 0.6%, Chromium 0.10%, Copper 0.25%.  | 6062 is generally used in applications similar to 6061. The alloy has a lower chromium content and better formability than 6061. Its strength is equivalent to 6061.  |
| 6063   | Available as: Extrusions.<br>Nominal Chemical Composition:†<br>Magnesium 0.7%, Silicon 0.4%.  | Widely used in architectural applications, trim, moldings, etc. Very good finishing characteristics, resistance to atmospheric corrosion. Moderate strength, excellent workability.   |
| 7075   | Available as: Bare or Clad Sheet and Plate, Wire, Rod, Extrusions, Forging Stock.<br>Nominal Chemical Composition:†<br>Zinc 5.6%, Magnesium 2.5%, Copper 1.6%, Chromium 0.2%.   | Aircraft construction, small gears, door keys. Highest strength aluminum alloy. Recommended when extra high strength, hardness are required. Can be formed by regular methods, but more care, precision necessary. Like 3004 and 2024, it can be spot welded but not fusion welded. Sheet and Plate usually clad for superior corrosion resistance. |

† Per cent of alloying elements—aluminum and nominal impurities constitute the remainder.

the form of hard compounds distributed uniformly throughout the section.

## Fabrication aspects

Although the aluminum alloys respond to all the known press-forming methods, the large variety of alloys available, in addition to the various tempers and structural conditions, will modify forming techniques. A rough indication of the formability index of a specific alloy can be obtained by both the elongation and the spread between the yield and the tensile strength. The fully-annealed temper is recommended for severe forming operations; the quarter-hard (H12), and the half-hard (H14), can be used for moderate forming operations; and the three-quarter-hard, along with the full-hard tempers (H16 and H18), are employed for simple bending.

The non-heat-treatable alloys are used to a considerable extent in press work applications; however, in the event that either high corrosion resistance or high strength values are required, a number of the heat-treatable alloys have good formability characteristics when in the annealed condition. However, since the work hardening rate of these alloys is high, a sequence of operations involving deep drawing will necessitate more frequent annealing. In the event formed material is to be heat treated, it usually is necessary to include a re-striking operation so as to nullify any distortion that may have resulted.

Alloy 1100, which is commercially-pure aluminum, is frequently used in the fully-annealed temper for very severe deformations without the use of intermediate annealing. However, alloy 3003-0 is preferred where conditions of forming will permit, due to the "non-earing" qualities of this alloy. Both sheet and strip can be employed; the latter offering advantages of continuous feed, lower material cost, and bulk handling. In either case, since these alloys are relatively soft, precautions in handling and storage must be observed so as to protect the surface from scratches, abrasion marks, staining, and dirt accumulation. If this is not observed, difficulty will be encountered in the form of damaged tooling, undesirable pick-up, or embedment of foreign matter on formed aluminum parts.

## Bending operations

In the non-heat-treatable alloys, the permissible bend will vary with the temper; the minimum inside radius on a 90 degree bend increasing as the temper of the material increases; the

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customer case histories, dealer comments, and spot survey results from an important Illinois community

## THE PROBLEM

# Facts on appliance service in the Champaign-Urbana area

A GUEST EDITORIAL

by *Marian Ingersoll* • HOME EDITOR, NEWS-GAZETTE, CHAMPAIGN, ILLINOIS

EVERYTHING IS ON A GRAND SCALE in this prosperous central Illinois Champaign-Urbana community; tall corn, huge numbers of university students, professors, new homes, cost of living, and problems with service of major appliances.

Although managers of five service departments reported that fifty per cent of the calls could be eliminated if customers read instruction books or learned to replace fuses, there are tales of woe from the rest of them.

### Are commercial laundries the answer?

Small wonder some homemakers are toying with the idea of turning to commercial "laundramats" when present equipment wears out.

Consider the case of Mrs. M whose . . . \* dryer went on the blink soon after her dealer went out of business. She has five active children, four of them sports loving boys. For some time she trekked to the commercial laundry several times a week and reported, "I really enjoyed it!"

Repairs were made, but shortly the dryer developed a metallic clanking sound. "It still worked but the noise got progressively worse; so horrible we couldn't talk on the telephone."

After another service call, Mrs. M thought a part had been ordered, and that the cost would be about \$50. After many calls to the service shop, however, she learned the repairman wanted first to consult another service department which handles her make dryer.

With that she called the latter serviceman herself. He came right out, discovered the fan was bent, and fixed it. Elapsed time, six months.

### Freezer failure for farm family

A well stocked freezer is a boon to homemaking, especially for the busy farm family. But Mrs. B is hard pressed to regain confidence in this convenience after a devilish experience last summer when her . . . freezer conked out.

Her husband has a large farming operation just south of town, and is on many farm policy committees, so he's coming in for meals at all hours. The couple has two cunning moppets, and Mrs. B is president of a large charity organization. Their's is the busy life.

When trouble developed in the freezer, a repairman was called. He said he would have to order a part, then fixed

the freezer temporarily and disappeared from the scene.

For six weeks, the food alternately froze and thawed, until it was a ghastly spoiled mess and all had to be thrown away. The desperate young matron called her repair department repeatedly. "I would complain bitterly, but it did no good for I never reached the person who knew anything about my case. Messages I left were ignored," she reminisced.

"Finally at summer's end, the part arrived and was installed. But sadly, by then I was raving mad and when the poor innocent little creature came to install the new part, I raked him over the coals and he had no idea why!"

### Lightning strikes twice in the same spot

For weeks, Merry Mothers Bridge Group was entertained with Mrs. R's appliance tragedy in two acts. Only her sense of humor kept her from going insane, and memorizing 20 instruction books couldn't have saved her!

*First Act:* Mrs. R coped with a broken door on her . . . refrigerator for the six hottest weeks in 1959. The strike on the door was broken, a "double strike" against this efficient ex-nurse and airline hostess, for the steel strike was on.

"For six weeks I tried to keep a chair propped against that door," she moaned. "And I got frantic, for every time someone walked through the room, he would neatly put the

THE AUTHOR: Marian Ingersoll (Mrs. Floyd S.) became the first home editor of the Champaign-Urbana News-Gazette about five years ago. Marian's column, "What's Ticking," won a second prize in the original column classification of the 1958 Illinois Press Association contest. Last year she was one of the winners in the "Alma" competition for outstanding journalism in home laundry education, and her recently published cookbook is "doing very well."

Marian's education includes a B.S. degree in education with a home economics major from the University of Missouri. She taught high school for a year and served as a home adviser during World War II. She has three daughters (one married) and two grandsons.

With this homemaking and journalism background, Marian is a qualified contributor to MPM's series on appliance service.

\*Ed. Note: ". . . ." replacing appliance names do not represent the number of letters in the trade name.

# OF HOME APPLIANCE SERVICE

chair back in its place against the wall, and I would find the refrigerator door open and everything dripping."

A strike was nowhere to be found; the R's waited and waited. One night in desperation Mr. R, a hotel manager, called a district representative of the company who stops at his hotel occasionally. This gentleman could not locate the part, so Mr. R called the Chicago office. Finally, the part was picked up in a small town. Don't go away, here is the . . . *Second Act:* Just as this mother of four felt her nerves were back to normal, her . . . dryer took a vacation! She called a repairman who looked at the dryer and said he would have to order a part. He vamoosed, and for one month the harassed homemaker called from time to time just to remind the manager that she was desperate; rainy weather, much laundry.

The day arrived when the serviceman came to install the part, which he did. But in so doing, he broke a wire which blew a fuse. "He said he thought the thermostat was broken and wasn't worth repairing. But I had looked at that dryer myself and knew the wire was not broken before the new part was put in," Mrs. R emphasized.

At this point, the R's didn't feel like spending \$50 more on the dryer so they bought a new one of a different make. "I still have that dryer and if I could find someone who could fix it, I would be happy," the wife said. "It has a huge fan and controlled temperature; kept the clothes from discoloring. My new dryer has a small fan which causes discoloration."

## Brushhoff routine

Going to the top, with a letter to the president of an appliance firm, brought nothing but a brushhoff to the head of a College in the University of Illinois. And he's still so indignant he roars, "Use my name if you wish!"

Dean P reports his household was in distress the day after he purchased a . . . dryer for his new home. It didn't work, and the family had nothing but trouble for five years.

"After our first call for service, the repairman worked roughly five days on the dryer; our little girl thought he came with the bathroom.

"The appliance seemed to be improperly wired, so the heating element was replaced. I must say the man was wonderful, and there was no charge.

"But between 1955 and the summer of 1959, we replaced the element once or twice, and the switch and the motor at least once. I wish I had kept the list and the cost!"

Although the dryer was properly connected and vented, lint would collect around the motor and catch fire. "We never had to call the fire department, but twice the situation was serious," the Dean said. "Every two weeks from then on, I disconnected the dryer, took off the back, and cleaned the lint from the motor!"

"What did I do about it? Complained, naturally. We'd spent easily as much as the original cost! The manufacturer said he could do nothing as one should expect normal repairs. Who can call our repairs normal?" he blasted. "The

company did send a man down from the office, but he just looked and went away.

"All that wearisome worry, and I repeat, all we got was the brushhoff, even from the president of the company!"

THESE GLOOMY CASES ARE EXCEPTIONS, fortunately, for the service picture is pretty rosy. A survey of homemakers made in April, 1960 shows facts are intermingled with fiction. One hundred questionnaires were returned, representing a fair cross section of the economic pattern in Champaign-Urbana. One fifth were those darlings, the struggling student wives. One fifth were college graduate home economist homemakers.

Fast service is the pride of our service departments. Fifty-six per cent received service the day they called, and 25 per cent the following day. Sixty-seven per cent reported they had confidence in their servicemen!

We noted that those whose bills were itemized were most satisfied with the cost. Fifty-five per cent thought the cost was reasonable and 35 per cent thought it high. Sixty-seven per cent reported their bills itemized.

At a large party recently, a prominent faculty wife was telling how thrilled she was with the survey since it was the first time she has had the chance to tell refrigerator manufacturers that they should make their product in some

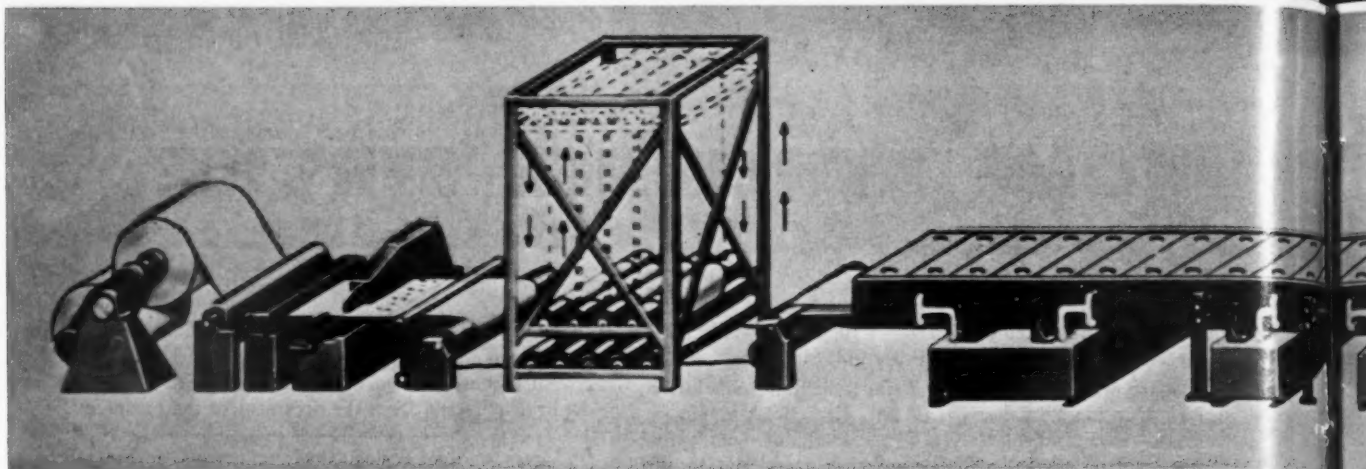
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## QUESTIONNAIRE

We wish to find out if service on major electrical and gas appliances in Champaign-Urbana pleases you.\*

1. Have you had a service call for a major appliance within the last 12 months? Yes 78% No 22%
2. When you had your last service call, how long did it take for the repairman to arrive?  
1st day - 56% 1 month - 1%  
2nd day - 25% 6 months - 1%  
longer - 17%
3. How long was your appliance out of order?  
1 day - 48% Longer - 9%  
2 days - 24% 6 months - 4%  
Week - 12% Always - 3%
4. Did you consider the bill low? - 4%  
reasonable? - 55%  
high? - 35%  
excessively high? - 6%
5. Was your statement itemized?  
Yes - 67% No - 33%
6. Did you have confidence in the repairman? (In other words, did you feel he knew what he was doing?)  
Yes - 67% No - 33%
7. Would you prefer appliances to be more simple and standardized?  
Yes - 86% No - 14%  
Do you like the excitement of new models every year?  
Yes - 30% No - 70%
8. Is there a timer on your range? Yes - 66%  
If so, do you use it? Of the 66%, 65% use them
9. What advice do you have for major appliance manufacturers?\*

\*Compiled from 100 questionnaires  
\*\*Comments in article



## Strip coating techniques

typical installation for the application of organic finishes to coil aluminum or steel

**A** DEVELOPMENT of great importance to the producers of coatings of all types for steel and aluminum, to the manufacturers of finished products who find it practical to use pre-coated sheet or strip, and to metal fabricators as well, is the rapid forward march

during recent months in the manufacturing facilities and development of end uses for these materials.

Practical application of pre-coated sheet and strip for fabricating end products is certainly not new. For a number of years many companies have used con-

tinuous and semi-continuous production equipment for coating aluminum and steel with baked enamels and other organic finishes, plating, vinyl laminates and plastisols and, in a few instances, with porcelain enamel. MPM editors have kept readers informed of this development through the news and full length feature articles.\*

For the most part, earlier installations for strip were for comparatively narrow widths, usually less than 12 inches.

The trend during recent months in installations for this purpose has been to wider and wider sheet and strip widths.\*\*

The newest coating lines for continuous coating of aluminum and steel from coil can handle strips 60 inches wide or greater, and are expected to greatly expand the applications for coated strip.

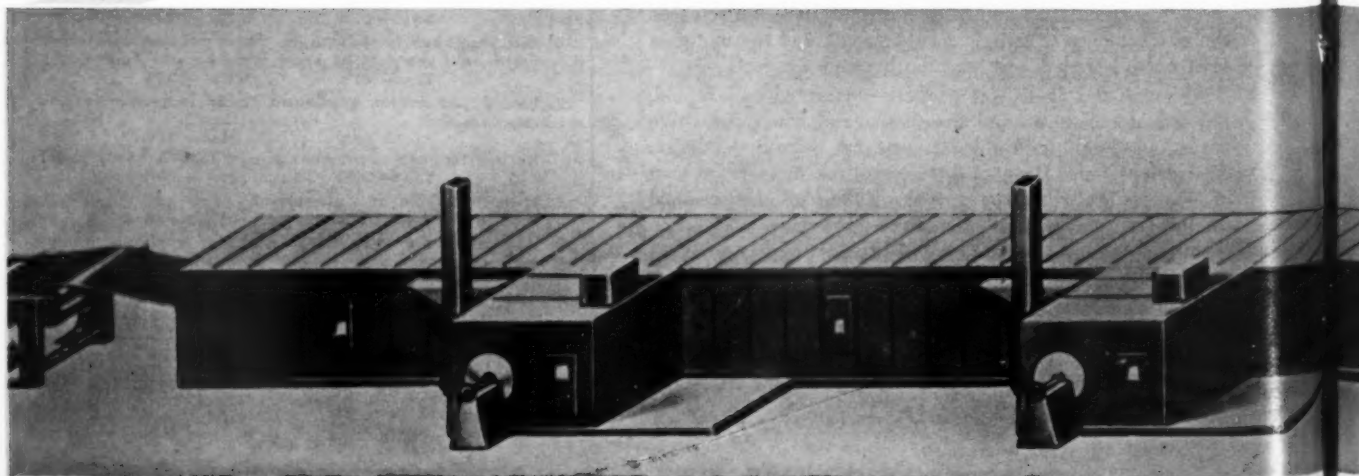
Plant operating features and case histories on these most recent installations will be presented in later issues of MPM. The purpose of this article is to visual-



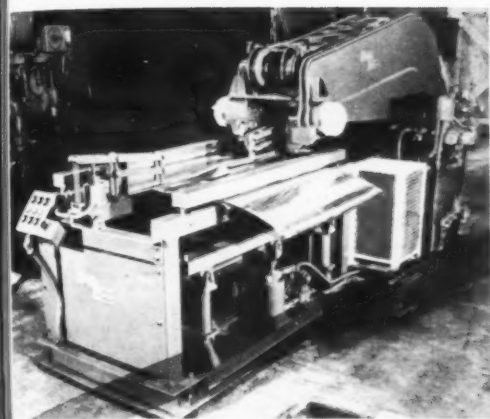
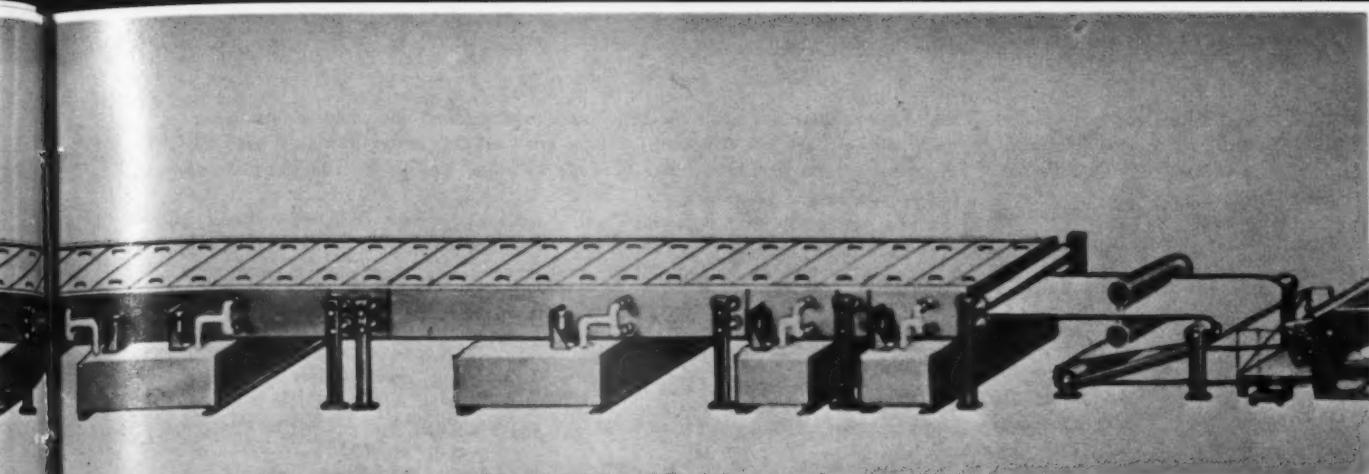
**Drive Roll unit (without drive) which pulls strip through coating and baking stages. Strip travels from left to right. It passes over the large entry roll, down and around the large lower roll, back up and around a second larger upper roll (see shaft end), between this roll and the smaller overhead nip roll, and down the line.**

\*See "Finishing before fabrication," from November, 1955 issue; "Central production line for porcelain enameling AllianceWall," from January, 1958 issue.

\*\*See "Coating coil steel in 48-inch width," November, 1959 issue.







**Stapling Machine** for joining ends of old and new coils.

ize and describe a typical installation for the application of organic finishes to aluminum or steel fed from coil, as a prelude to features on actual installations.

As might be expected, the wide strip presents technical problems which are more complex than those presented by the narrower widths, such as tracking control, uniform coating, and minute variations in strip thickness.

#### Important elements

The essential elements of a strip coating line include the following: (1) a metal cleaning and preparation ma-

chine; (2) coating and/or laminating equipment; (3) oven or ovens suitable for curing the finishes after application; (4) accumulators for storing strip at the start and end of the continuous line, so that production can move through without interruption; (5) power equipment for advancing the strip through the unit, while keeping it tracking properly and at the correct tension; and (6) coilers and uncoilers for feeding the strip and recoiling, following the coating application.

Although there are various types of uncoilers suited to this type of line, the one illustrated is a two-spindle turret uncoiler, which supports the coils between pivot arms incorporating tapered steel cones or mandrels which extend into both ends of the coil. The pivot arms may be adjusted to accommodate various widths of strip and to center the strip with reference to processing equipment. Hydraulic cylinders adjust the arms as required. The uncoiler unit may include either electric or air-operated brakes. As will be evident, this type of equipment provides for a quick changeover from a depleted coil to a new one. As the new coil is unwound, the cones vacated by the original coil may be reloaded in readiness for continuous operation.

In the line illustrated, a feed roll following the unwinder serves to advance

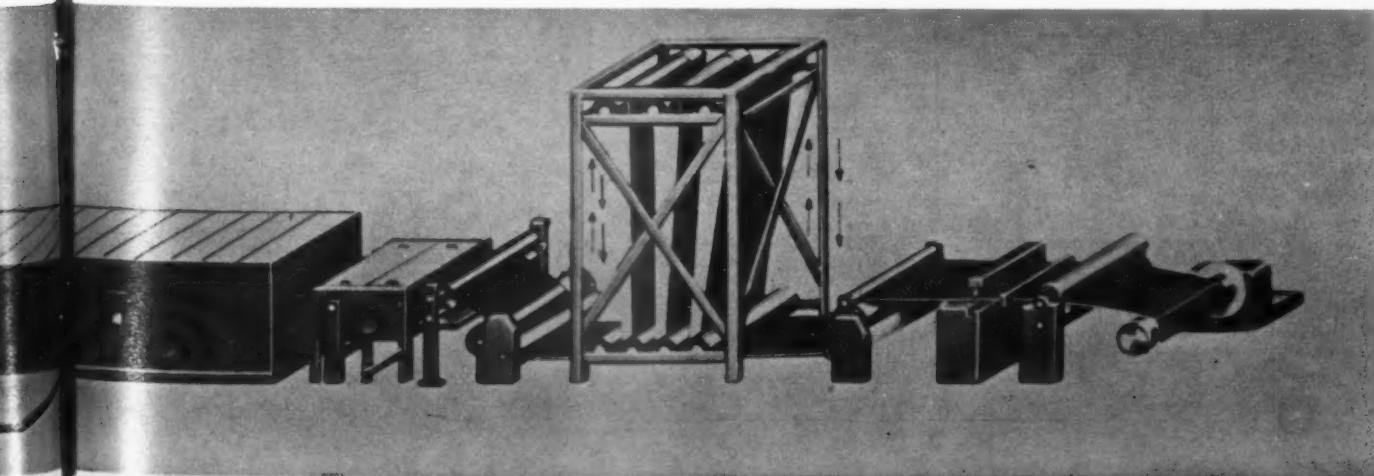
the leading edge of a new coil into a shear and stapling machine and/or welding equipment.

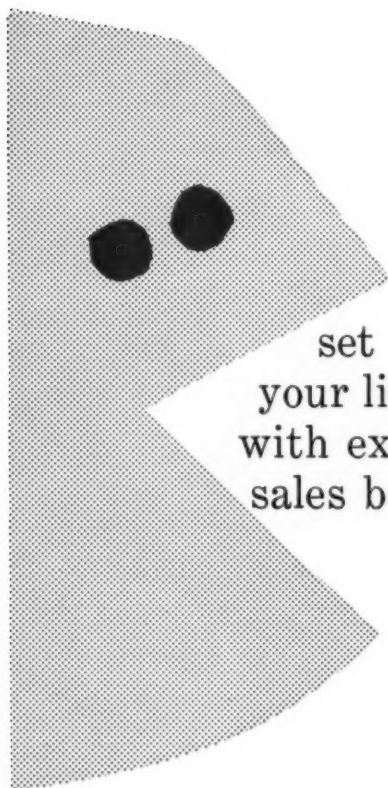
#### Splicing the ends

After the trailing edge of a depleted coil has passed through the feed roll unit, the leading edge of a new coil is fed between the rolls and advanced into



**Accumulator Frame.** Strip makes multiple passes over upper and lower rolls (not yet installed). One set of rolls "floats" up and down to enable strip to be accumulated and payed out as required.





set  
your line  
with extra  
sales bait

• specify • specify

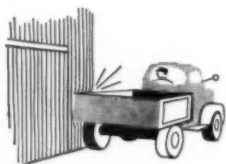
**ti-co**

**NON-FLAKING  
GALVANIZED  
SHEETS**

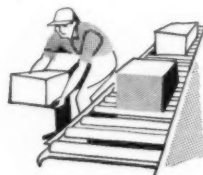
## for **DURABILITY**

Tough, strong, corrosion-resistant... that's Inland TI-CO... the non-flaking galvanized sheet with the rugged coating plus the inherent strength of steel. ■ Easy formability, too. Deep-draw, spin, punch, crimp, Pittsburgh lock-seam—work TI-CO to the very limit of the base metal—and you'll never have a chipping, peeling, cracking or flaking problem. ■ That's why manufacturers of products calling for endurance under roughest treatment—buildings, conveyors, chutes, siding, highway guard rails—use TI-CO to add "sales bait" to their product line.

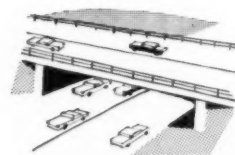
**INLAND STEEL COMPANY** 30 West Monroe Street • Chicago 3, Illinois Sales Offices: Chicago • Davenport • Detroit  
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*Farm buildings made from non-flaking TI-CO maintain corrosion-resisting coating under toughest abuse.*



*Though subjected to constant abrasive action, TI-CO adds years of service to this roller conveyor.*



*Denting, scratching, weathering won't stop the protection of highway guard rails afforded by TI-CO.*

the shear and stapler. The trailing edge of the preceding coil is held under the stitcher head until the new strip is inched forward into place for shearing, and then forward into stapling position. Aluminum or light steel is overlapped in this manner, and a metal stitcher employed for joining. For processing heavier strip steel, welding equipment is required at this point.

Following the joining, the power source for moving the strip reverts to the "pull" of the production line drive. At this point, an entry bridge pulls the strip from the uncoiler (except when acting as a holdback during splicing). Sets of edge flattening rolls follow the entry bridge to flatten burrs and other edge irregularities.

#### Strip accumulators

Very important units in a line of this type are the accumulators for storing a backlog of strip so the line may continue to operate. The first accumulator serves to keep the line in operation while a splice is being completed. In the accumulator itself, the strip makes multiple passes over a series of rolls at two levels. One set of these rolls "floats" from top to bottom of the stand, while the other set is fixed. As a splice is being completed, the floating rolls move downward toward the fixed rolls. Then after the splicing is completed, the entry bridge operates at accelerated speed to restock the accumulator and allow the upper set of rolls to reach their normal position at the top of the stand. Bridle speed is then automatically reduced to normal operating speed.

#### Metal preparation

As in the case of all metal coating lines, an important key to a satisfactory finished product lies in the metal cleaning and preparation equipment. In the case of the line illustrated, the metal

preparation machine incorporates six stages (only five are used — the sixth provides for a shift from aluminum to steel). The following represents typical time cycles for a line travelling 100 feet per minute and a metal preparation machine 135 feet long.

| Stage                    | Time<br>(Seconds) | Degrees<br>F. |
|--------------------------|-------------------|---------------|
| 1) Clean                 | 20-30             | 160           |
| 2) Rinse (hot or cold)   | 5-10              | to 160        |
| 3) Aluminum preparation* | 15-20             | 110           |
| 4) Steel preparation*    | 15-20             | 160           |
| 5) Rinse (cold)          | 5-10              | —             |
| 6) Acid rinse            | 5-10              | 140           |

\* The aluminum stage is bypassed when running steel and vice versa.

Squeeze rolls are located between cleaning stages to prevent carryover from tank to tank. In this instance hinge-mounted, rubber covered rolls are employed. Located at the exit end of the machine is a squeeze roll and sensing device to actuate a mechanism for shifting the strip if compensation is needed for any misalignment in travel.

A drying and cool-off station following the metal preparation machine may consist of several vertical or horizontal passes at room temperature, and if space requirements are at a premium, forced air can be employed to accelerate the drying-cooling.

#### Coating equipment

In this line, roll coating equipment is employed, and as the strip passes the top backing roll, paint is applied by a small diameter applicator roll rotating in a reverse direction to that of strip travel. As the strip leaves the coating equipment, the back side passes over a second applicator roll so that both sides are painted with one pass through the equipment. In the equipment illustrated, the material is pre-metered by means of chrome-plated steel rolls that pick up the paint from coating pans and trans-

fer it to the applicator rolls. Individual roll speeds within the machine offer a wide variation in coating weights.

#### Baking equipment

Following the application of the coating, there must be at least a short distance at room temperature, with proper ventilation, to effect coating flowout.

The oven in the line pictured is divided into two zones, each with individual gas-fired heating equipment and temperature controls. This unit is designed to bake at temperatures up to 600° F. in the first zone, and up as high as 700° F. in the last zones. (This would take care of specialized finishes such as vinyls, plastisols and organosols). The equipment is designed to force heated air against both sides of the strip. The access doors and observation windows allow for inspection within the equipment and for threading during the start of operations.

Provision can also be made for two coat operation (prime coat and finish) by installing two complete ovens in tandem or one above the other.

Following baking, the strip passes through a water spray and is dried by squeeze rolls and an air blow-off if required.

The exit accumulator, shown loaded in the illustration, works in a manner similar to the one preceding the metal preparation machine, except that the accumulator at the exit end runs empty under normal operating conditions, and serves to accumulate strip from the line while the stitched section or splice is cut out and the following strip attached to an empty coiler.

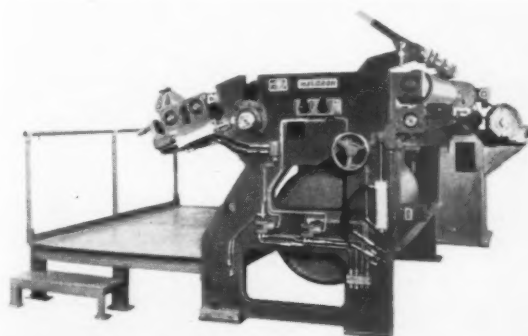
While a spliced section is being cut out in removing a rewind coil, the exit feed roll stand holds back the strip by pinching, or nipping it between two rolls. The strip accumulates in the accumulator, the floating rolls rising toward the top. The feed roll stand jogs the strip forward as required for shearing and starting a new coil, after which the feed roll stand rolls release the strip and normal operations resume.

As indicated, this illustrated feature shows a "typical" continuous line for the application of organic coatings to aluminum or steel. Later articles will give complete information on newest equipment in existing production lines.

MPM editors wish to thank William M. Bevis, John Waldron Corp., and Allen S. Dawe, J. O. Ross Engineering, for technical assistance in connection with the development of this illustrated feature.

**Coater.** Web passes beneath operator's platform, around larger lower roll, back up and around a large roll which is partially hidden, and on to the oven. Paint is

applied to one side of strip by an applicator head as the strip rounds upper roll. The opposite side may be coated by a second applicator roll as strip leaves the coater. The applicator heads comprise small-diameter applicator rolls and steel metering rolls; rolls pick up paint from coating pans and transfer it to applicator rolls which then apply it to the strip.





**Table 3—180-Degree Cold Bending of Aluminum and its Alloys—Recommended minimum inside radius**

| Temper      | Thickness | Alloy*   |
|-------------|-----------|----------|
| 0           | 0.016"    | ABCDEFGH |
|             | 0.032"    | ABCDEFGH |
|             | 0.064"    | ABCDEF   |
|             | 0.125"    | ABCD     |
|             | 0.1875"   | ABC      |
| H12 and H32 | 0.016"    | ABCDE    |
|             | 0.032"    | ABCD     |
|             | 0.064"    | ABC      |
|             | 0.125"    | AB       |
|             | 0.1875"   | AB       |
| H14 and H34 | 0.016"    | ABCD     |
|             | 0.032"    | ABC      |
|             | 0.064"    | ABC      |
|             | 0.125"    | AB       |
|             | 0.1875"   | A        |
| H16 and H36 | 0.016"    | A        |
|             | 0.032"    |          |
|             | 0.064"    |          |
|             | 0.125"    |          |
|             | 0.1875"   |          |

\* The alloys listed are those that can be bent 180 degrees on itself; thicknesses not tabulated have equal workability if within the maximum limits indicated.  
KEY TO SYMBOLS: A—1100; B—3003; C—5050; D—5052; E—3004; F—6061; G—2014; H—2024; E—Alclad 3004; H—Alclad 2024.

## Fabricating

→ from Page 47

data given in Tables 3 and 4 can be used as a guide where the equipment employed is similar to press brakes, tangent benders, etc. In lock seaming, roll or draw bench forming, where the metal is gradually worked, the radii may be somewhat smaller depending upon the design of the equipment. It may be as much as 50 per cent smaller.

## Shearing and slitting

Although conventional methods are used, there are a few precautions to observe when working with aluminum alloys. Guillotine shearing requires hold down pads that are faced with a shock absorbent material, such as rubber, to avoid marking the sheet surface. Frequently shear beds, tables, or benches may require the shellacking of heavy cotton flannel to their surfaces to preserve surface finish. Closer clearances are required for the annealed temper than for tempered or heat-treated material in guillotine shearing. With respect to the use of slitter knives, which require no rake, a clearance value of 0.0015 inches is usually specified for all alloys and tempers.

## Blanking, piercing and punching

In a blanking operation, the value for tool clearances will vary from 0.12t to 0.18t depending upon the shear strength of the alloy, this value increases

ing to the higher limit as the shear strength increases. This ratio of tool clearance and shear strength is given in Table 5. A decrease in pressure requirements can be obtained by using a shear on either the die or the punch; the value of shear being approximately equal to the thickness of the material. The location of shear depends on the operation, the shear being ground on the die where blanking is performed, and is ground on the punch when minimum distortion of the material is necessary in a punching operation.

Clearance values for such operations as hole punching, piercing, and perforating should be approximately equal to 5 per cent of the metal thickness. In addition, a die relief of not less than 0.75 degrees should be provided to obtain a quick "getaway." Smooth, sheared edges of small pierced holes can be obtained in a two-stage operation; the first operation consisting of pierce-

ing slightly undersized, which is followed by a shaving operation to the required size using angle-ground punches.

**Table 5—Blanking Tool Clearances**

| Shear Strength, psi | Die Size           |
|---------------------|--------------------|
| Up to 10,000        | Punch Size + 0.12t |
| 10,000 to 12,000    | Punch Size + 0.13t |
| 12,000 to 15,000    | Punch Size + 0.14t |
| 15,000 to 18,000    | Punch Size + 0.15t |
| 18,000 to 24,000    | Punch Size + 0.16t |
| 24,000 to 30,000    | Punch Size + 0.17t |
| 30,000 and up       | Punch Size + 0.18t |

Shear values given in Table 3, Section B can be used, and "t" is the metal thickness.

NEXT MONTH  
DEEP DRAWING AND  
SPINNING  
PART II

**Table 4—90-Degree Cold Bending of Aluminum and its Alloys—Recommended Minimum Inside Radii**

| Temper   | Thickness, inches | No Radius | Recommended Radii, inches |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------------------|-----------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|  |                   |           | 1/32                      | 1/16  | 3/32  | 1/8   | 3/16  | 1/4   | 5/16  | 3/8   | 1/2   | 5/8   | 3/4   | 1     | 1 1/4 | 1 1/2 |
| 0  | 0.016             | ABCDEFGHJ | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.032             | ABCDEFGHJ | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | ABCDEFGH  | .....                     | J     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | ABCDEFGH  | .....                     | ..... | J     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | ABCD      | .....                     | EFGH  | ..... | ..... | J     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| H12 and H32  | 0.016             | ABCDE     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.032             | ABCDE     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | ABCD      | .....                     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | ABC       | .....                     | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | ABC   | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| H14 and H34  | 0.016             | ABCD      | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.032             | ABCD      | .....                     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | ABC       | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | A         | .....                     | BC    | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | A     | BC    | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| H16 and H36  | 0.016             | ABC       | .....                     | DE    | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.032             | A         | .....                     | BC    | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | .....     | .....                     | ..... | ..... | A     | BC    | ..... | D     | E     | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | A     | BC    | ..... | D     | E     | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | A     | BC    | ..... | D     | E     |
| H18 and H38  | 0.016             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.032             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 6061-T4 and 2014-T3  | 0.032             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.250             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| 6061-T6, 2014-T6, 2024-T3, 7075-T6, Alclad 2024-T3, Alclad 7075-T6 | 0.032             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.064             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.125             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.1875            | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
|  | 0.250             | .....     | .....                     | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

NOTE: For thicknesses not shown, use the radii listed for the next heavier gauge.

KEY TO SYMBOLS: A—1100; B—3003; C—5050; D—5052; E—3004 and Alclad 3004; F—6061; G—2014; H—2024 and Alclad 2024; J—7075 and Alclad 7075.

# PERMA-GRIP<sup>®</sup> handles

You can now purchase your appliance handles built to Mills' quality standards. Twelve standard models are offered and six standard patterns are available on any model handle. All handles have plastic spacers which serve as a thermo-break. If you wish, consult with our engineering department regarding special custom requirements. We have the skilled personnel, the specialized equipment, and we use the right materials to assure a reliable source for quality PERMA-GRIP handles. Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on PERMA-GRIP handles.

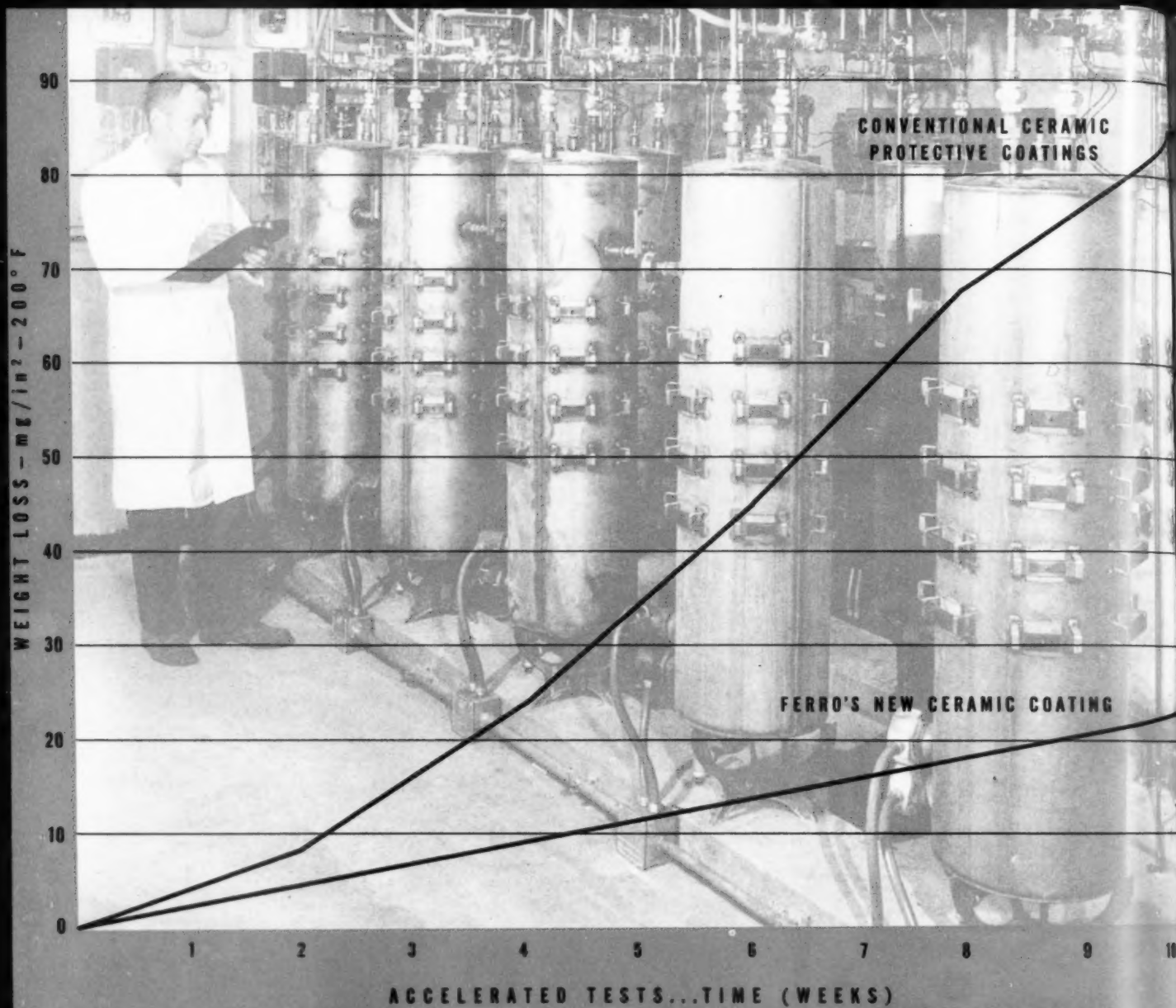
## Dixie Products, Inc.

is a Mills customer of long standing. The Dixie range shown at the right is equipped with PERMA-GRIP door handles. It is also equipped with the universally accepted PERMA-VIEW oven door window, another engineered product of Mills Products, Inc.



# MILLS PRODUCTS INCORPORATED

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## Good news for buyers of water heaters

Still longer service life, often far exceeding present warranties, can now be built into water heaters. While good news to buyers and users, this can be even more important to *manufacturers* of such equipment—because even minor improvements in quality mean dollars in customer satisfaction.

As will be seen from the graph above, Ferro's new ceramic coatings for water heaters mark a long step forward in corrosion resistance. Based

on accelerated "life" tests, Ferro's new glass coatings are vastly superior in resistance to corrosion by hot water.

Two *completely new* porcelain enamel frits have been developed by Ferro in working out the "answer" to product quality improvement. If you wish to improve *your* product, let us show you what we have been doing. Contact your Ferro Sales-Service Representative or write us direct.



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# MPM

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## High Starting-Torque Gearmotors

A complete line of gearmotors with torques from .4 to 300 inch pounds at 800 to fractional rpm gives the machine designer what he needs to assure dependable performance and service-free operation, according to the manufacturer. These gearmotors provide starting torques up to 120 per cent of running torques for instant



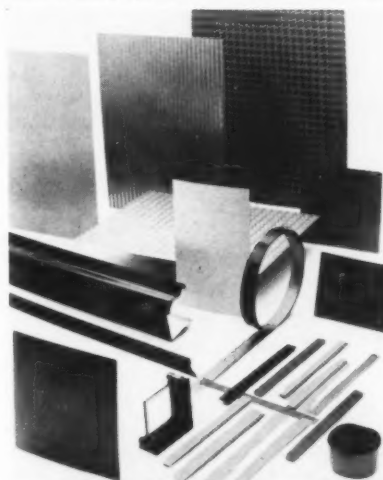
starting even in the middle of the vending cycle. They are said to provide higher torque per pound of motor and require less space.

Write Dept. MPM, Merkle-Korff Gear Co., 213 N. Morgan St., Chicago 7, Ill.

## Color-Coated Stainless Steel

A color-coated stainless steel, known as "ColorRold," and consisting of the application of uniform color finishes to regularly produced stainless steel sheet and strip, has been announced.

Developed from an organic coating formula, ColorRold combines all the durability and corrosion-resisting qualities of stainless steel with



the versatility of color harmony.

The material can be sheared, bent, formed, and drawn to extreme degrees without damage to the color coating, according to the manufacturer.

The present ten standard colors and white in the ColorRold system maintain a high degree of color fidelity and lend themselves to a multitude of architectural and consumer products. The

material is available in coil or sheet form up to 48" wide in all popular gauges.

Write Dept. MPM, Product Development Dept., Washington Steel Corp., Washington, Pa.

## Iron Phosphate Coating

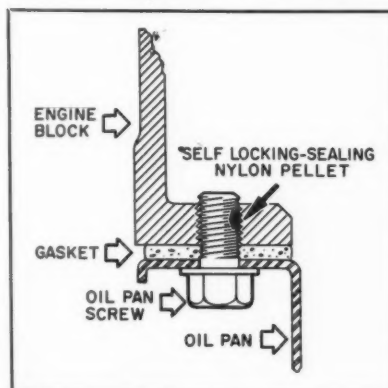
A new iron phosphate coating, Detrex 910, cleans and phosphates in one operation. According to the manufacturer, it is able to accept up to 15 times more alkali than other products.

Despite this high hard-water tolerance, 910 is said to remain in the proper pH coating range to produce superior phosphate coatings. The product is designed for use in continuous mechanical spray washing equipment ranging from a two to six-stage operation. Among the applications to which 910 is said to be suited are such items as automotive stampings, appliances, outdoor metal furniture, farm and gardening implements, metal tools and hardware.

For full information write Dept. MPM, Detrex Chemical Industries, Inc., Box 501, Detroit 32, Mich.

## Self Locking-Sealing Fastener

A simple, practical solution to the problem of assembling oil pans to engine blocks without over-compressing gaskets has been reached through the use of a resilient protruding Nylon pellet in a blind hole tapped in the threaded



section of the oil pan screws. When the fasteners are threaded into the engine block, compression of the protruding pellet creates a strong spring-like wedging action that locks and seals the mated threads together. This locking-sealing action occurs wherever wrenching stops, whether the part is seated or not, and the constant lateral thrust is sufficient to insure a positive, vibration-proof assembly without the use of lockwashers or sealing compounds.

For further information, contact Dept. MPM, Nylok-Detroit Corp., Troy, Mich.

## Glass and Metal Sealing Alloy Available

Therlo, a glass and metal sealing alloy in commercially vacuum-melted form, is now being produced. According to the manufacturer, it is more easily formed into desired shapes and increases die life 25 to 50 per cent between sharpenings. It also produces permanent vacuum-tight seals with negligible leakers on the production line. It is said to match such commercially-hard glasses as Corning 7052 and 7040 in expansivity from 80 degrees to the annealing point.

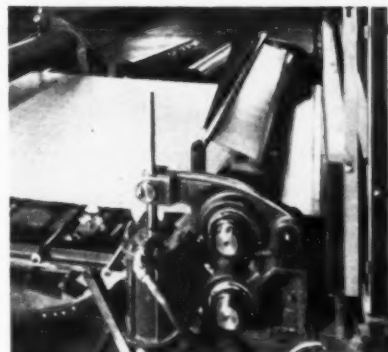
Therlo is one of four alloys developed for glass-to-metal sealing of both hard and soft glasses in virtually every sealing operation.

For further information, contact Dept. MPM, The Driver-Harris Co., Harrison 36, N. J.

## New Vinyl Laminate

A vinyl-metal laminate that is said to combine in one product the ultimate properties of the metal with the optimum characteristics of vinyl has been introduced.

Called Clad-Rex 102, the new system reportedly produces a vinyl-clad metal that can be worked with conventional metal forming



equipment to severe configurations, and permits exposure to elevated temperatures without delamination.

According to the company, Clad-Rex 102 can be formed as deep as 9:1 ratio without the metal fracturing or the vinyl pulling away from the metal at the time of forming. The vinyl-clad metal has been exposed to elevated temperatures for extended periods of time without the necessity of any previous post curing or annealing between forming and trimming.

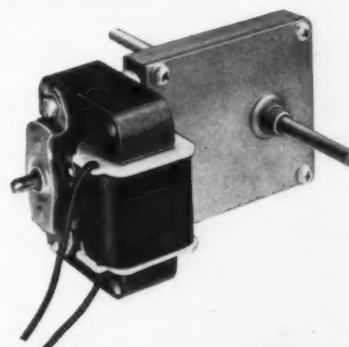
The material is available in most decorative designs of vinyl, in outdoor weatherable vinyls, and in stain-resistant vinyl where exposure to foods, hospital medications, etc., are anticipated.

Write Dept. MPM, Clad-Rex Div., Simoniz Co., 11500 W. King, Franklin Park, Ill.

## Worm Drive Fractional Horsepower Gear Motor

A sub-fractional horsepower worm drive gear motor has recently been announced. Identified as Type WGM, the motor is said to offer quiet operation at low cost. Suggested applications are for appliances, vending machines, instruments, motorized business machines, and many others.

The motor is of two pole, shaded pole, ac induction type, is available in voltages ranging from 6 to 220 volts, 50 or 60 cycle, and can



be designed for continuous or intermittent operation. Cooling fan is available on continuous duty applications, with self aligning porous bronze bearings with felt oil reservoir for life-time lubrication. Output speeds are from 1/2 to 300 rpm, with output torque as high as 50 inch pounds at 1/2 rpm.

For further information, contact Dept. MPM, Molon Motor & Coil Corp., 3739 Industrial Ave., Rolling Meadows, Ill.

Announcing...the latest  
addition to our family  
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## MEYERCORD DRI-MARK

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DRI-MARK... is Meyercord's newly perfected line of PRESSURE SENSITIVE signs and trade marks produced as durable Truck Signs, Window Signs, Nameplates and Product Markings. These startling new films include:



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Whatever your sign needs, you owe it to yourself to investigate Meyercord's complete line of products. Our factory trained representatives will be glad to assist you in the proper selection of markings for any particular requirement. Write today.



## Paint storage and handling... the Kelvinator way

When MPM editors visited Kelvinator's Grand Rapids, Mich. plant to gather material for the Kelvinator special section (May, 1960 MPM), they saw a paint storage and distribution system that was worthy of photographic and editorial attention. However, space limitations in the special section did not permit thorough coverage of this aspect of Kelvinator production. This short feature, therefore, is a "PS" to the 48-page section.

PAINT STORAGE and distribution facilities at Kelvinator serve three paint systems: one for home laundry equipment and two separate systems ("junior" and "senior") for refrigeration appliances.

Among the parts that are finished in the home laundry line are end panels, upper outer doors, lower outer doors, covers, lids, dial covers, instrument panels, fan housings for the dryer and inner door covers for the dryer.

These parts, intermingled on the conveyor, pass through a five-stage cleaning and phosphatizing machine, and then to a flow-coat machine where an epoxy-type prime coat is applied to a thickness of .3 to .6 mil. The prime coat is then baked 20 minutes at 425°F.

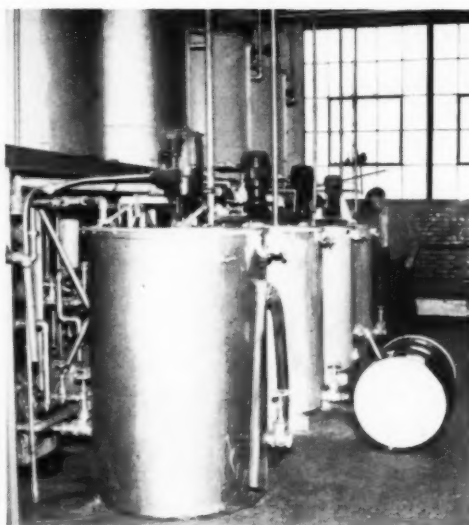
Parts requiring a cover coat are transferred to a conveyor feeding the electrostatic spray equipment; the other parts are sent to sub-assembly points.

The cover coat is applied in two electrostatic spray stations and one hand spray booth. The finished ware is baked 30 minutes at 300°F.

### "Senior" refrigeration line

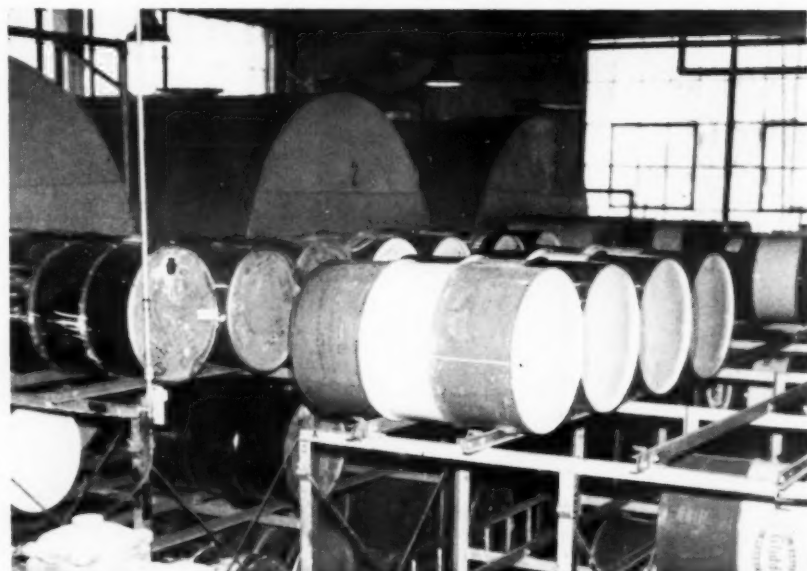
The "senior" line for refrigerators, freezers and ice cream

to Page 61 →

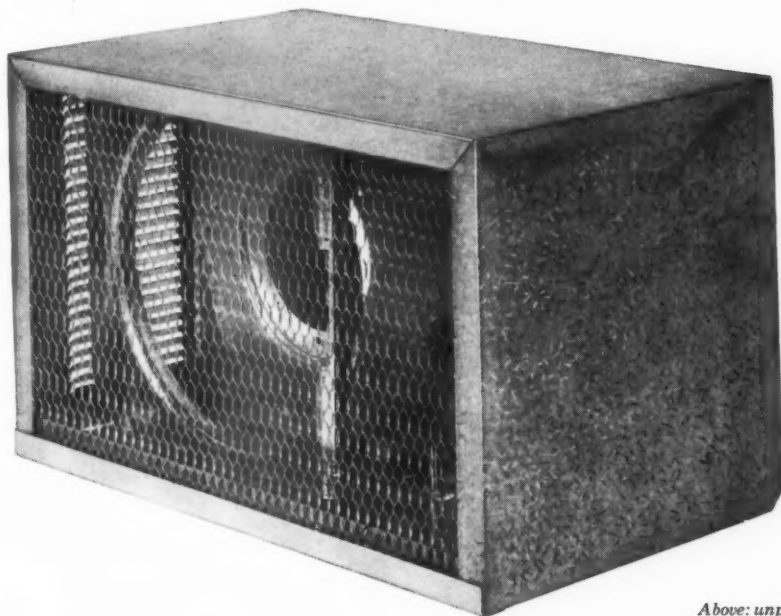


Section of paint mixing and storage facilities serving the recirculating paint system.

Three large storage tanks are visible in the background; 55-gallon drums in foreground store finishing materials for "junior" line.



*Better Products Through Better Methods and Steels*

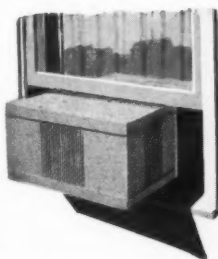


*Above: unpainted air conditioner cabinet*

How modern zinc-coated steel sheets keep air conditioners weatherproof—season after season after season.

When cold-rolled sheet steel formed the cabinets and special drawn base pans of air conditioners, they were primed and painted inside and out to protect them from constant exposure and functional moisture. Even so, corrosion often took hold around fastenings, louver edges and scratches.

Now that Weirkote continuous-process zinc-coated steel is used, the cabinet, louvers and chassis can be cut, bent and formed (even worked to the limits of the steel itself) without chipping or flaking the corrosion resistant



zinc surface. When the outside paint finish is applied (primarily for decoration) the air conditioner has the double protection of a coating of paint and a coating of zinc assuring corrosion-free service for many years to come.

It's because of this weather-shedding surface, this superior formability that continuous-process zinc-coated steel is more and more the metal specified for air conditioning, heating and ventilating equipment.

A major supplier: Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel and many other steels that improve products, methods and profits throughout industry.

**WEIRTON STEEL**

*Weirton, West Virginia*



*Weirton Steel is a division of*

**NATIONAL STEEL CORPORATION**

*Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana*



# GENERAL EXTRUSIONS

... PUTS  
INSTANT  
INSTALLATION



In Quiet Kool's

**KOOL-MOUNT\***

AIR CONDITIONERS by EMERSON RADIO

The hit of the new room air conditioning season is the new QUIET KOOL by Emerson Radio—the first air conditioner designed for true instant installation. BUILT-IN sliding aluminum filler panels permit the unit to be put in operation almost as soon as it is placed on a window sill. The free-sliding frames for these Kool-Mount\* panels are aluminum extrusions by GENERAL EXTRUSIONS, INC.

The G.E.I. sections not only slide freely and fit tightly, but they also enhance the beauty of this versatile air conditioner. What's more, this manufacturer's requirements for durability and economy have been met by G.E.I.'s uniform quality and complete conformance to critical specifications.

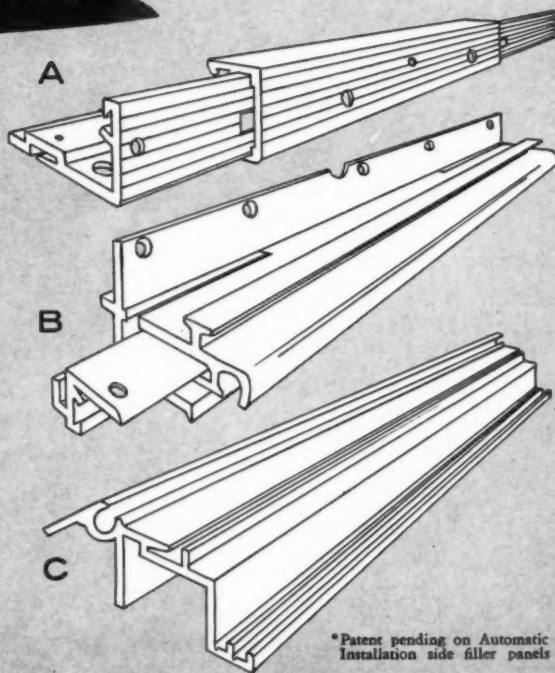
Once again G.E.I. has pioneered a new application for extruded aluminum. If you have a problem which might be solved by G.E.I.'s specialists in design and production, why not take it to a G.E.I. representative? G.E.I. guarantees speedy and high quality anodizing and fabrication and can give you complete and unsurpassed service in all phases of aluminum processing.

## GENERAL EXTRUSIONS, INC.

4040 LAKE PARK ROAD • YOUNGSTOWN, OHIO

SALES OFFICES AT ST. LOUIS, PITTSBURGH, CHATTANOOGA,  
CINCINNATI AND CLEVELAND

CONSULT YOUR CLASSIFIED PHONE BOOK UNDER  
ALUMINUM PRODUCTS



\*Patent pending on Automatic  
Installation side filler panels

## Harvestore

→ from Page 37

sheet with the aid of a large rubber stencil. The glass slip is applied with a hand spray gun, the stencil removed from the sheet, and the letter edges are carefully "sharpened up" by hand. The sheet is refired, usually on the second shift, in the production furnace.

### Packaging and shipping

Finished sheets are stored to allow "sequence packaging." An electric shop truck, equipped with a suction-cup boom crane, picks up the sheets from the storage skids and places them on a trailer attached to the truck. As the truck moves down the aisle, a Harvestore storage structure is progressively loaded.

When the loading is completed, the sheets are stacked on two shipping skids in the proper sequence for erection. The roof assembly is added to the top of one of the stacks, and the skids are "packaged" securely with wood bracing and steel straps. The complete unit is then moved into the pre-shipment area.

Almost all the Harvestore and Permaglas units are shipped by truck. Along with the sheets, any additional equipment, such as unloaders or conveyors, plus a parts box containing bolts, nuts, sealer, steel stakes and other items, are loaded on the transport truck.

### Paint storage

→ from Page 58

cabinets is set up to handle the all-white painting.

The "junior" paint line is used for finishing refrigeration parts in color and finishing miscellaneous parts that cannot be efficiently processed on the automatic, high-production spray line.

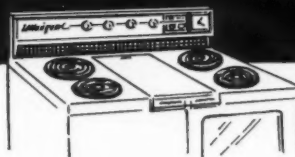
### Paint storage and handling

Enamels for home laundry and refrigeration equipment are purchased in tank car lots. The paint mixing room is in a building separate from the main plant, and a recirculation system supplies the materials to the point of application.

Three 5000-gallon storage tanks are located outside the paint storage room. These tanks are used to store thinners and reducers that are used in greatest quantity. This material is pumped directly into the paint mixing tanks, which are elevated so the prepared material flows by gravity into the tanks for the recirculation system.

Colors and special finishes for the "junior" line are stored in the original 55-gallon drums which are equipped with air-driven propeller agitators.

# What's Cookin'?



... Come September  
there'll be plenty cookin' when the

Still-Man Manufacturing Corporation  
will introduce a new line of electric surface units  
for range and hotplate  
manufacturers—



THE

# Still-Man TOPP BURNER

TRADE MARK

**WATCH FOR IT!**



**MANUFACTURING CORPORATION**

429 EAST 164TH STREET • NEW YORK 56, NEW YORK  
The Last Word in Electric Heating Elements

**STILL-MAN MANUFACTURING CORP.**

429 East 164th Street, New York 56, N. Y.

Please keep us posted on what's cookin' with your new Still-Man TOPP BURNER Electric Surface Unit.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

15M-8-60



## BURNING WITH AMBITION

*For fifty years, Pemco has retained its enthusiasm for the unexplored. Today, the flame of research burns with even greater intensity. Pemco Research continues to lead the way toward further developments and improvements in low temperature and one-coat enamels to help you maintain highest product quality at lowest manufacturing cost.*

FIFTY YEARS OF RESEARCH AND A FLAME

**PEMCO** CORPORATION

BALTIMORE 24, MARYLAND

HIGH QUALITY PORCELAIN ENAMEL FRITS AND COLORING OXIDES



## Facts on appliance service

→ from Page 49

models without the huge freezer compartment. "That is not what a large family with a family freezer needs," she said.

Speaking out appeals to women, so, in the survey, they had three opportunities: 86 per cent expressed preference for appliances to be more simple and standardized . . . 70 per cent said they do not like the "excitement" of new models every year.

The range timer is still a mysterious gadget of the gremlin world to some, but of 66 per cent who have them, 65 per cent use them.

In the "Advice to Manufacturers" blank, it boiled down to these points: Ignoring the impossibility of keeping every part known in stock, women plead for this very service, even for obsolete models.

They'd like good simple models outmoded less frequently.

Other comment: "All servicemen should have a general knowledge of all makes to cut cost" . . . "Removable tops and service from the front for ease of repair" . . . "Fewer frills" . . . "More reasonable prices" . . . "Labor costs should be cut" . . . "Make them simple so husbands can repair" . . . "Better operating manuals" . . . "Don't exaggerate performance—such as for automatic defrosting and delicate fabric settings" . . . "More testing" . . . "Pay more attention to your local dealers and the cost and quality they give" . . .

### Talking back

To be objective, a reporter must hear both sides, so I huddled with managers of five service departments whose service calls begin at \$3.50 to \$5.

"The manufacturer in his advertising has a job to do," one counselled. "Women must realize appliances are more complicated with added features. Most are so delighted at prospect of ownership, they do not listen to the salesmen or the men who go out to demonstrate their new purchases. They must learn to read the manuals!"

The managers need broad shoulders. Over half the people who call are angry and "chew him out." When the repairman arrives, they are gracious — he is there to do them a favor.

"Many of our washer calls are customer's fault, which I can tell from the call. But they get madder than H—— if I try to explain and tell them what to do," a 25-year veteran said.

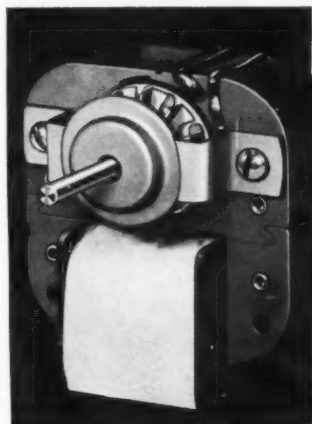
"I have a gripe about getting some parts," another reported. "We carry \$15,000-\$20,000 worth, and still have to order some which take from one to six weeks to arrive."

"Do-it-yourself" husbands are poison to the boys. "They get in our hair," one explained. "A man tears down an appliance not realizing we tear it down in a certain way to minimize the work. Often he has dismantled some part unnecessarily. I hate to arrive and find all the parts in a box 'so they won't get lost'!"

"Time someone put these consumers straight to the fact that maintenance is normal — and if abnormal, can often be traced to abuse. It should normally cost \$12-\$18 a year to maintain a washer. If this appliance goes untouched for five years, then costs \$65, that is normal," one manager said. "I like to point out that the new Humko plant brought in maintenance men FIRST — they know the value of maintenance from the beginning, and realize that difficulties may arise the first year. It's a simple way to explain the one-year appliance warranty."

My conclusion: Champaign-Urbana customers are shopping for good service facilities when they buy appliances.

# ALLIANCE MOTORS



dependable  
power...  
sensible  
cost

**MODEL JS**—a versatile, efficient, miniature power plant for business machines, vending machines and many control, switch and signal applications. Supplied from stock or customized to your specifications.

### TYPICAL JS SPECIFICATIONS

| Full Load<br>RPM | Torque<br>oz./in. | Watts | Amps | Weight      |
|------------------|-------------------|-------|------|-------------|
| 2900             | 2.70              | 29    | 0.57 | 1 lb. 2 oz. |



### MODEL JSG

An extremely quiet gear train motor used in TV tuners, remote controls, rotisseries and other appliances. Mounting, operating temperature, clutch or solenoid action, torque, RPM and many other characteristics can be varied in this Alliance motor designed to meet your individual application.

### TYPICAL JSG SPECIFICATIONS

| Output<br>RPM | Torque<br>oz./in. | Watts | Amps | Full Load<br>H.P. | Weight      |
|---------------|-------------------|-------|------|-------------------|-------------|
| 12-14½        | 165               | 25.5  | 0.49 | .002              | 1 lb. 7 oz. |

Write for complete catalog and price quotations

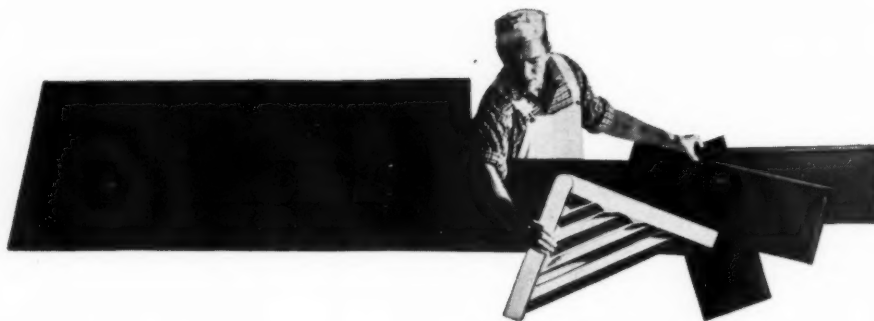
WORLD'S LARGEST PRODUCERS OF SUB-FRACTIONAL  
HP MOTORS FOR MOST USES INCLUDING  
STEREOPHONIC AND HI-FI EQUIPMENT

## THE ALLIANCE MANUFACTURING CO.

(Division of Consolidated Electronics Industries Corp.) ALLIANCE, OHIO

Another new development using

## B.F. Goodrich Chemical *raw materials*



Geon helps aluminum build the **house of ease**\*



Reynolds Metals Company, Richmond, Virginia, applies coatings of Geon to aluminum for fabrication into the products you see here and many others for use in homes and other products. B.F. Goodrich Chemical Company supplies the Geon vinyl.

**B.F. Goodrich**

Now, nearly every exposed part of a house can be made of aluminum coated with Geon vinyl. *Shingles, siding, soffits, gutters, downspouts and storm and screen doors* are all providing homeowners a new kind of easy living.

Because the enamel-like finish is made of Geon, colors will never fade and will last far, far longer. There'll be no cracking, no crazing, no chipping—none of the worries that bother homeowners with maintenance problems. No rusting either.

The Geon coating is baked on the metal permanently—during manufacture. Even stamping, bending, forming or a mild draw will not harm this tough, elastic, abrasion-resistant finish. And, of course with Geon, you can get any color desired.

Here are several excellent examples of how manufacturers are taking advantage of the unusual properties of Geon vinyl on aluminum to open new markets and improve existing products. To learn more, write Dept. GD-5, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

\*A program of Reynolds Metals Co.



**B.F. Goodrich Chemical Company**  
a division of The B.F. Goodrich Company

### H. C. Little Buys Tamco

H. C. Little Burner Co., Inc., San Rafael, Calif., has purchased Tamco Corp., Sebastopol, Calif. Tamco will continue to operate as a separate enterprise.

Tamco manufactures the Clipper brand of forced air furnaces and air conditioning equipment and the Barnes brand of gas-fired floor furnaces.

### Acme Industries Expands

Acme Industries, Inc. has started construction on a 100,000-sq.-ft. manufacturing plant on a 50-acre site in Greenville, Ala. Future plans call for increasing this unit to 250,000 sq. ft.

The company also reported that its sales of air conditioning and refrigeration systems were at record levels during the first three quarters of the company's current fiscal year.

### Lewyt Predicts Sales Boom

Alex Lewyt, president of the Lewyt Corp., predicts vacuum cleaner sales will hit six million annually within the next 10 years. Speaking at a meeting of the company's sales executives recently, Lewyt said the industry is now selling nearly four million cleaners a year, and the climb to six million presents a relatively easy selling job when "one considers the country's growing population and new family units."

The industrialist said that now is the time for manufacturers to cement their relationship with consumers by producing good products.

### Waste King Earnings Up

Waste King Corp. has reported net earnings for the year ended March 31 of \$758,523, an increase of 29.1 percent from the \$587,472 the year before.

The higher profit is equivalent to \$1.27 per common share, up from \$1.14 per share, adjusted for common shares issued on conversion of both series B and series C preferred, and as stock dividends.

### Radio Receiver Dept. Moved

Transfer of General Electric Co.'s Radio Receiver Dept. headquarters from Bridgeport, Conn. to Utica, N. Y. has been completed. The final move involved the office of Robert C. Wilson, department general manager; William B. Clemmens, marketing manager; and Herbert Connelly, finance manager.

### Howard Announces New Plant

Howard Refrigerator Co., Inc. has announced plans for the construction of a new building to house manufacturing, engineering and administration. The building, which will be located on a six-acre site in the Northeast Air Port Development, Philadelphia, is scheduled for completion by the end of the year. Further construction is expected to follow at a later date.

Operations of the two existing Howard plants in Philadelphia will be consolidated in the new building. Products of Clover Refrigerator Co., a Howard affiliate, will also be manufactured in the new factory.

### Coin-Op Laundry Introduced

A pre-built, completely packaged, fully equipped coin-operated laundry has been placed on the market by Berry Equipment Co., Pierre, S. D. The unit is manufactured by Midway Sales Co., Grapevine, Texas.

The laundry is of steel frame construction, with 2 x 4 floor and side wall framing, insulated with two-inch fiberglass, and finished in aluminum siding. The building, 12 feet wide by 50 feet long, contains four dryers, 14 nine-pound washers, three 16-pound washers, a 75-gallon water heater with a 200-gallon storage tank, coin changer, soap dispenser, folding table, four chairs, outside and inside signs, room heater, air conditioner, and an awning.

### Westinghouse Redesigns "W"

The Circle W trademark of the Westinghouse Electric Corp. has been redesigned for the fifth time in the 74-year history of the company "to keep the symbol modern and to improve our



corporate identity," according to Howard S. Kaltenborn, vice president-assistant to the president. The company's logotype also has been redesigned so that it is compatible with the new trademark.

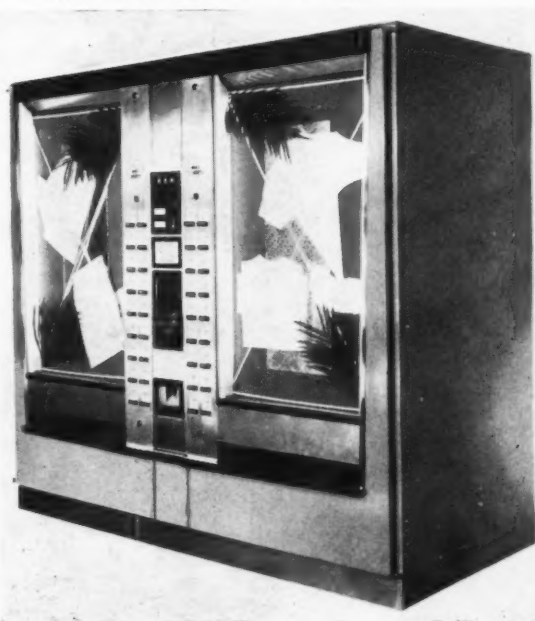
The new trademark still retains the traditional circle, but the dimensions have been changed and three small solid circles have been added to the peaks of the W.

### Whirlpool Sets Up Training Department

The formation of a new department to carry on and expand Whirlpool Corp.'s management and operations

### New Vending Machine Accepts Currency, Gives Change

*A prototype model of a machine which accepts currency as well as change, dispenses merchandise, and returns the proper change, is in use at Macy's New York. Developed by National Rejectors, Inc., and National Vendors, Inc., the machine dispenses shorts and T-shirts. It accepts any amount of money up to \$9 in any combination of coins, \$1 and \$5 bills. Change is delivered in a combination of coins and bills. Coins are returned loose, and bills are returned in disposable cardboard cylinders.*





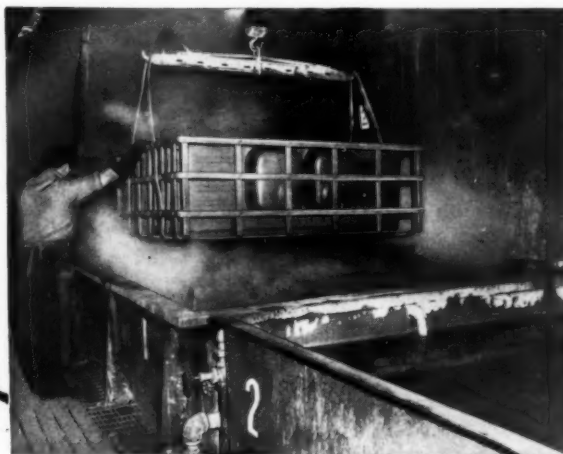
**MAC CHEM**

**1-2**

**CLEANING  
PROCESS for  
ENAMELING**

## **for High Quality PORCELAIN ENAMELING**

**IT'S A HIGH SPEED CLEANING PROCESS  
THAT CLEANS SO IT STAYS CLEAN**



In enameling, there's nothing so costly and disheartening as rejects. If you are faced with this difficulty—due to unclean metal parts—Mac Chem 1-2 Enameling-Cleaning Process can be of an infinite help.

While we do not claim that Macco Cleaner and Cleaning Process will entirely eliminate all rejects, we do maintain they will reduce them to minimum.

**1** Mac Clean No. 20 is a Heavy Duty Cleaner specifically designed to remove all special enameling drawing compounds, etc. It is a fast, easy-to-use, economical cleaner—non-toxic, non-corrosive, and non-injurious to metals.

**2** Mac Chem No. 30 is a Second Step, Light Duty Cleaner which removes all residue from the cleaner baths, leaving the metal so chemically clean that it stays clean and readily accepts acid pickle and nickel.

### **FOR QUICK RESULTS**

*Write or phone Macco today and have a Macco engineer make a demonstration in your plant. No obligation, of course.*

This 2-Stage Metal Cleaning System is serving some of the country's largest porcelain enameling plants. Can be used with equal effectiveness in both automatic and batch type equipment.

**MACCO**

**PRODUCTS  
COMPANY**

**Manufacturers of Better Metal-Working Compounds since 1931**  
9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS • PRESCOTT 9-0800

training for wholesale distributor personnel has been announced by Jack D. Sparks, vice president in charge of RCA Whirlpool appliance sales department.

"Establishment of this new department formalizes a program first begun as a series of distributor management seminars in early 1959 and emphasizes once more our conviction that Whirlpool's health depends in large degree on the health of the distributors and dealers who are its marketing partners," Sparks said.

Named to head the new department as distributor development manager is Robert P. Lewis, until recently director of consumer relations and a Whirlpool employee since 1947.

### Frigidaire Test Meter Said to Simplify Service

Frigidaire 1961 model automatic washers have been designed to make servicing easier, according to E. E. Landis, general service manager.

Using a new functional test meter, developed by Frigidaire service engineers, it is reportedly possible for a serviceman to completely diagnose control or component difficulties in about two minutes, an operation previously requiring 30 minutes or more.

The new procedure is made possible by the redesigned washer cabinet on which the top and control panel may be quickly removed without moving the cabinet away from the wall. All electrical connections between the control panel and the unit have been channeled into a multi-pole plug which may be readily uncoupled permitting the timer and switches to be serviced at a more convenient location if desired. The test meter has channels for checking all controls and circuits.

### Admiral Books Record Orders

Admiral Sales Corp. booked orders for more than 350,000 pieces of television, stereophonic phonographs, radios and advance 1961 appliances at its recently concluded series of six meetings for more than 4000 dealers held in Miami Beach and Las Vegas.

"We are back-ordered through August on all products," said Carl E. Lantz, president. "These meetings were the most successful ever conducted by Admiral and topped last year's orders by a very substantial margin."

### LFC Gets Military Contracts

Two government contracts have been awarded to Landers, Frary and Clark, New Britain, Conn. The first of these

contracts is with the U. S. Navy, utilizing the recently expanded research facilities of the company. This project deals with a classified national defense research and development program.

The second government contract is for the manufacture of aluminum food containers for the U. S. Army Quartermaster, amounting to \$530,381.

### Polymer Builds New Plant

Construction has begun on a new Polymer Corp. plant in Northwestern Industrial Park, Rolling Meadows, Chicago.

The principal operation of the new plant will be plastic coating of metal products with the new Whirlclad coating system, and demonstration of the technique to prospective licensees who desire to use the patented coating method in their own plants.

### Ross Opens New Sales Office

J. O. Ross Engineering Div., Midland-Ross Corp., recently announced plans for the opening of a new sales office in Mobile, Ala.

R. C. MacDuffee, currently in the company's Mt. Prospect, Ill. office, will head the new office. MacDuffee, a 1948 mechanical engineering graduate of Iowa State College, joined the Ross organization in 1953, after a short tenure with the A. O. Smith Corp.

### Kaiser to Triple Output of Super Purity Aluminum

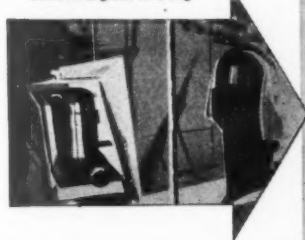
Production of super purity aluminum is being tripled at Kaiser Aluminum & Chemical Corp.'s Mead, Wash. reduction plant with the installation of six new refining cells.

Construction of the specially-designed

## Here's the PHOSPHATE COATING You asked **TURCO** TO MAKE

During the first six months of 1959, Turco undertook an extensive survey of the phosphate coating market. Hundreds of users of these coatings were interviewed. Thousands of questions were asked. When the answers were tabulated, Turco began the task of building an iron phosphate process to the exact specifications called out in the survey.

The new process is now available. It is called Turco Paintite. Paintite has been thoroughly field-tested in the production lines of a dozen Turco customers. It has passed the most severe tests with flying colors. Turco is proud to announce the addition of Paintite to its ten other Turcoat phosphate and conversion coating processes that provide a better bond for organic finishing.



HERE'S HOW  
**PAINTITE**  
SCORES ON SURVEY'S  
**12** "MOST  
WANTED"  
FEATURES...

—Formulated as Result of Industry-Wide Survey...

1. **SUPERIOR CLEANING**—Exclusive wetting system provides heavy-duty uniform cleaning. Cleans & phosphates simultaneously.
2. **TEMPERATURE VERSATILITY**—Efficient anywhere within range of 140° to 180°F. Temperature control is not important.
3. **LOW FOAMING**—at any temperature within recommended range.
4. **LESS POST RUST**—Eliminates post rusting problem often encountered with iron phosphate processes.
5. **NO WHITE STREAKING**—Extra free rinsing. Leaves no residue.
6. **ECONOMICAL**—Low in initial cost. Low in maintenance cost. Low in cost per sq. ft. Long-lived, even under mass production use.
7. **UNIFORM COATING**—even on edges and points. Won't show through on low-pigmented paints.
8. **USE VERSATILITY**—used by immersion, spray washer or steam cleaner.
9. **LESS SLUDGE**—less scale. Minimizes clean-up problems.
10. **RESERVE ACIDITY**—combats alkaline water conditions. Constant control not necessary.
11. **SUPERIOR SERVICE**—by Turco's vast network of technically trained servicemen, located in industrial centers throughout the world.
12. **REQUIRES ONLY 3 STAGES**—for dip or spray washing. Can be efficiently used in 5-stage operations, if desired.



**FREE!**

VALUABLE BOOKLET  
PHOSPHATING REFERENCE CHART  
TECHNICAL DATA BULLETIN

Get the full story on Paintite and the other ten phosphating and conversion coating processes in the complete Turcoat line. Write for your copy, along with Turco's Phosphating Reference Chart, today!



**TURCO  
PRODUCTS, INC.**

Chemical Processing Compounds  
24600 South Main Street, Wilmington, California  
FACTORIES: Rockdale, Ill., Houston, Wilmington,  
London, Rotterdam, Sydney, Mexico City, Paris,  
Hamburg, Montreal, Manila, Naha (Okinawa)  
Offices in All Principal Cities

TURCO PRODUCTS, INC.  
24600 South Main St., Wilmington, Calif.

MEWEL AFFIX COUPON TO COMPANY LETTERHEAD

Please send valuable booklet with Phosphating Reference Chart and full details on Paintite. I understand there is no cost or obligation on my part.

NAME  
TITLE

MP

cells, which are said to be the largest of their type in the industry, is in progress, and actual production is expected to begin in September. Each cell will have an annual rated capacity of 360,000 pounds, making the plant's total capacity for super purity aluminum more than three million pounds annually.

### GE President Forecasts Trend to Automation

Robert Paxton, president of the General Electric Co., believes that American industry faces a great challenge in "the intelligent use of automation and other exploding technological resources to keep our economy strong and profitable."

He cited industry's needs to increase productivity, cut costs, and eliminate the profit squeeze "as absolute necessities to our future economic survival." The key to this economic challenge, Paxton said, is industry's ability and willingness to make automation flexible enough to do whatever job is required of it. The rapid development of automatic, program-controlled machine tools—capable of turning out highly accurate, finished machining of complex pieces under punched-tape instructions—clearly indicates that automation applies to the job shop as well as the production line.

### Binks Names School Dates

Class dates for their fall and winter tuition-free spray painting school have been announced by Binks Mfg. Co. The schools will be held September 12-16; October 3-7; November 7-11; and December 5-9.

Conducted by Jack Adams, director of customer research, the school will cover all aspects of spray painting, including the latest developments in spray equipment systems and automatic spray controls.

The free school is open to all industry. For more information and registration forms, write Dept. MPM, Binks Mfg. Co., 3114 Carroll Ave., Chicago 12, Ill.

### Production Exhibits To Feature Automation

Automation will be the theme of most exhibits at the Production Engineering Show at Chicago's Navy Pier, September 6-16. The exposition will run concurrently with the Machine Tool Show at the International Amphitheatre.

The Machine Tool Show is sponsored by the National Machine Tool Builders Association. The Production Engineering Show is presented by agreement with the association, but is independent of it.

The \$10 million exhibit at Navy Pier

will show the equipment and products which keep machine tools running. Products to be shown and demonstrated include control equipment, machine components, auxiliary equipment and supplies, intraplant communications, safety equipment, materials handling equipment, inspection and gauging equipment, testing equipment, and special production equipment.

### CISFM Summer Conference

The Canadian Institute of Stove and Furnace Manufacturers mixed business with pleasure at their recent summer conference at the Alpine Inn, Ste. Marguerite Station, Quebec.

Ernest Orr, president of Orr Associates Ltd., speaking on "Creativity in Canadian Design" emphasized that new and improved designs provide the challenge which engineers need, and also create fresh interest to spark increased efforts by the sales department.

New equipment to provide electrical spark ignition for gas appliances was demonstrated for the first time in Canada, to illustrate the address by Paul Nees, research and development manager, Controls Co. of America.

The conference attracted over 80 delegates and their wives.

### Maytag Chicago Formed

T. G. Hearn has been named president of the Maytag Chicago Co., a new subsidiary of The Maytag Co. The firm has been organized to handle Maytag product distribution in metropolitan Chicago.

### L. R. Kerns Renamed

The stockholders of the L. R. Kerns Co. have voted to change the corporate name to Kerns United Corp.

In view of the company's expansion program, which includes increased national and international sales coverage, product diversification and additional manufacturing facilities, the company felt the new name would be more descriptive of the entire operation.

### ALCOA To Expand Mills

Aluminum Co. of America has announced plans to expand and modernize its two major sheet mills at Davenport, Iowa, and Alcoa, Tenn., at a cost in excess of \$18 million. Alcoa said the investment was being made in anticipation of a sharp rise in demand for aluminum sheet products predicted by company marketing experts.

The two-year construction program will involve expenditures approximating \$10 million at Davenport and in excess

# DOC TUFFY

## TO THE RESCUE

HHMMMM — SPOT WELDMENTS LIKE PERFORATED PAPER. THAT'S NEW!

BURN-THROUGH! WARPING! ALL KINDS O' TROUBLE, DOC! WHAT'M I GONNA DO?

NOW YOU JUST FOLLOW THOSE TUFFALOY CATALOG SUGGESTIONS, AND YOU'LL SEE A REAL IMPROVEMENT!

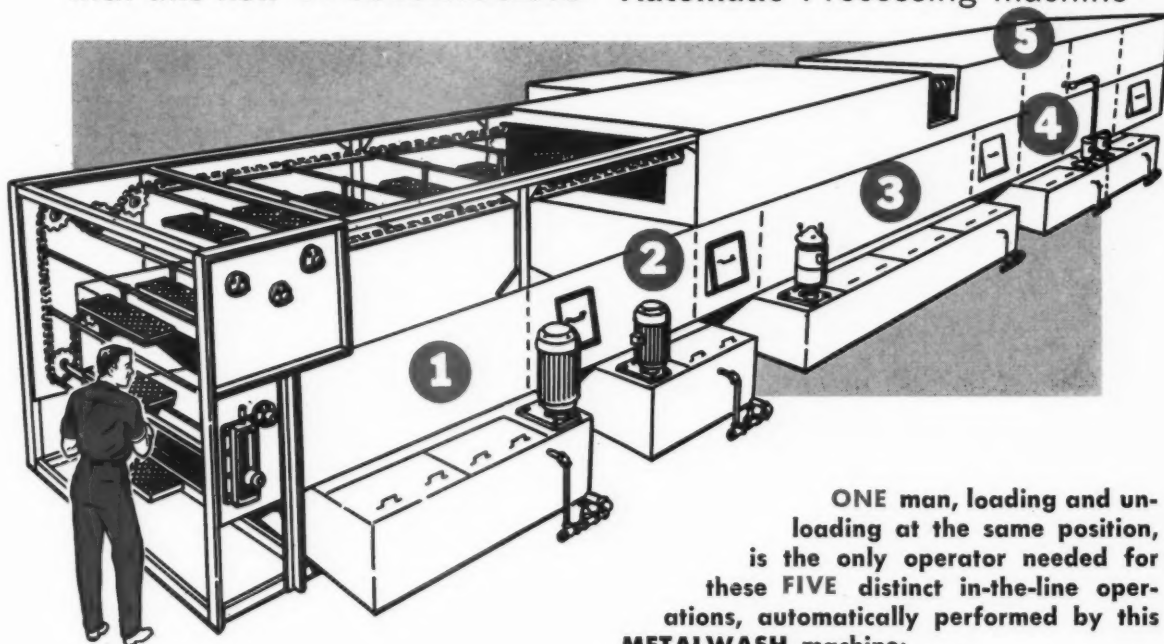
TUFFALOY COLD FORMED TIPS do a better job than forged or cast tips. But you weld better with any electrode when you follow the suggestions in the Tuffaloy catalog. It has information on tips, shanks, holders, bar stock, accessories and prices. Call your Airco or Tuffaloy office.

**AIR REDUCTION SALES COMPANY**  
 A division of Air Reduction Company, Incorporated  
 150 East 42nd Street, New York 17, N. Y.  
 Air Reduction Pacific Company; Air Reduction Canada Limited



# 1 WILL GET YOU 5

with this new *Metalwash*® Automatic Processing Machine



ONE man, loading and unloading at the same position, is the only operator needed for these FIVE distinct in-the-line operations, automatically performed by this METALWASH machine:

This is the actual record of a METALWASH automatic Metal Processing Machine which was recently installed for a nationally-known brake shoe manufacturer.\* Operating at production line speed, the compact METALWASH machine prepares 1440 brake shoes per hour for bonding, performing the Five major operations with only One operator. METALWASH engineering experience can solve your metal washing and finishing problems, too. Write or call today for complete details of this and other METALWASH time-, money-, and labor-saving metal finishing systems.

\*Name and address upon request.

- 1 METAL WASHING with hot recirculated power spray wash and cold recirculated power spray rinse.
- 2 METAL PICKLING with hot recirculated power spray pickle and cold recirculated power spray rinse.
- 3 METAL PHOSPHATIZING with hot recirculated power spray iron phosphate and cold recirculated power spray rinse.
- 4 METAL SEALING with hot recirculated power spray Parcolene Sealer.
- 5 HOT BLAST METAL DRYING, economically using flue heat from the processing tanks.



**Metalwash**® MACHINERY CORPORATION

Established 1926

900 North Avenue / Elizabeth 4, N. J.



## **This finish stays cool under fire**

It's not every day that a metal product finish is doused with flammable liquid and set on fire—even in the Glidden laboratories.

But it was tried this time, and, as expected, the coating was unharmed. Glidden technologists had good reason to have confidence in this product, because they had already subjected it to tests which proved its superiority as a heat resistant finish.

Glidden laboratories are constantly putting finishes through every conceivable test in developing formulations resistant to abrasion, impact, humidity, cold, corrosion, stain, grease, and any other conditions they might possibly face.

This is just another reason why your Glidden salesman can be sure when he recommends a protective system for you. He has complete information on the best Glidden finishing system to meet your requirements.



### **FINISHES FOR EVERY PRODUCT**

The Glidden Company  
INDUSTRIAL PAINT DIVISION  
900 Union Commerce Building • Cleveland 14, Ohio  
In Canada: The Glidden Company, Ltd., Toronto, Ontario

No matter what your product, process or problem, Glidden Finishes plus Glidden Technical Service can provide the answer.

of \$8 million at Alcoa. Beside the equipment program, the project will involve a major expansion of plant warehousing facilities at Alcoa and Davenport.

### Maytag Names Service Winner

Harold J. Wheeler has been named winner of The Maytag Co.'s third annual President's Service Award. The award was presented to Wheeler, service manager of Maytag West Coast Co., at the appliance firm's ninth national service conference in Newton, Iowa.

Wheeler received the award "in recognition of exceptional qualifications in keeping with the highest standards of character and ability directed toward fostering superior consumer service."



Harold J. Wheeler (right), service manager of Maytag West Coast Co., holds plaque he received upon being named winner of The Maytag Co.'s third annual national President's Service Award. The award was presented by George M. Umbreit (left), Maytag president. In the center is S. R. Payne, Maytag's general service manager.

### Tappan Dishwasher Coming

Field tests of The Tappan Co.'s dishwasher have started on schedule, according to Dave Shelly, product manager for the new item.

The recently announced addition to the Tappan line will be manufactured at the Mansfield plant, where extension expansion has been completed within the past few months to accommodate the new product.

Present plans call for full production of the dishwasher in early 1961.

### Avondale Name Changed

Effective July 1, 1960, the name of Avondale Marine Ways, Inc., New Orleans, La., has been changed to: Avondale Shipyards, Inc.

### Olin Appoints Distributor

Appointment of Hunter & Haven, Inc., Bridgeport, Conn. as a distributor for Olin Aluminum has been announced by the Metals Div., Olin Mathieson Chemical Corp. The company is marketing Olin Aluminum rod, bar, sheet, tubing and extrusions throughout Connecticut.

## Obituaries

### Raymond J. Kraemer

Raymond J. Kraemer, 64, of The R. C. Mahon Co., died June 30. For the past three years he had been senior vice president and director of purchases. He joined the Mahon organization in 1927.

### William H. Roberts

William H. Roberts, executive vice president of Detroit Stamping Co., died June 21 at the age of 42.

Mr. Roberts worked for the company his entire adult life, and is largely credited with the development of the large line of De-Sta-Co toggle clamps.

### GAES Midwest Chapter Announces New Officers

The Midwest Chapter of the Gas Appliance Engineers Society has announced the installation of new officers: Jerry T. Alger, president; William H. Patrick, vice president; Willard E. Kendall, secretary; Paul F. Nesse, treasurer; John R. Thomson, one-year trustee; and Charles Matilo, two-year trustee.

### AHLMA Adopts Advertising Practices Code

Recommended advertising practices have been voluntarily and unanimously adopted by 20 home laundry appliance manufacturers who "influence an estimated \$100 million worth of advertising annually."

Homer L. Travis, chairman of the board of directors of the American Home Laundry Manufacturers' Association, announced adoption of the advertising guide.

Purpose of the guide, according to Travis, is voluntarily to bring the highest degree of integrity to industry advertising and to help upgrade advertising practices by manufacturers, distributors and dealers. The guide is consistent with recently published advertising guides of the Federal Trade Commission. It provides a guide in layman's language to certain specific advertising situations in the home laundry appliance industry.

Association members who endorsed the guide account for virtually 100 percent production of automatic and wringer washers, gas and electric clothes dryers, and combination washer-dryers, according to AHLMA.

"The 20 manufacturers making up the association represent an estimated \$100 million worth of appliance advertising at the national and local level through factory, distributor and dealer-placed advertisements in newspapers,

### NEMA Elects New Officers

Officers have been elected by three industry sections of the National Electrical Manufacturers Association:

#### Industrial Heating Units and Devices Section:

Chairman — Robert P. Kelly, Tuttle & Kift, Div. of Ferro Corp.; Vice Chairman — R. F. Kitchen, Cutler-Hammer, Inc.; Chairman, General Engineering Committee — G. B. Desloge, Watlow Electric Mfg. Co.; Vice Chairman, General Engineering Committee — William R. Russell, General Electric Co.

#### Industrial Laminate Section:

Chairman — R. R. Titus, Synthane Corp.

#### Manufactured Electrical Mica Section:

Chairman — E. O. Hausmann, Continental Diamond Fibre Corp.

### AWS National Fall Meeting

The American Welding Society has announced that its national fall meeting will be held September 26-29 at the Hotel Penn-Sheraton, Pittsburgh, Pa. Seventeen technical sessions will be held. Four of the sessions will be sponsored by the American Society of Civil Engineers and two of these are co-sponsored by the Column Research Council of the Engineering Foundation.

magazines, television and radio," Travis is stated.

### NARDA and NEMA approve

The National Appliance and Radio-TV Dealers Association, through the executive committee of its board of directors, has endorsed the practices. "It is very much in line with long range policy of NARDA calling for industry initiative in preference to relying on legislative and judicial action by government," Gail Pinkstaff, NARDA's executive vice president, stated.

The board of directors of the Consumer Products Division of the National Electrical Manufacturers' Association also has endorsed AHLMA's Recommended Advertising Practices.

### An eight month study

During eight months of preparation, an industry committee composed of merchandising and legal representatives of member companies explored what might be done voluntarily on an industry-wide, self-enforcing basis to eliminate doubtful advertising practices.

"The guide will not only have beneficial influence on advertising and selling at all levels, but will also help build customer confidence in the home laundry industry and the products it produces," Travis said.

For a copy of the Practices, write to MPM or AHLMA.





## You can't buy this tie in a haberdashery

Even the finest English clothiers couldn't furnish you a necktie like this one. We're using it to demonstrate how you can form USS Galvanized Steel Sheets. Even when we tied it in a bow, there was no flaking of the zinc coating.

USS Galvanized Sheets don't flake because there's a tight, uniform bond between zinc and steel. Add excellent ductility and you have galvanized sheets that are ideal for severe fabrication. To give your products added quality, always specify USS Galvanized Sheets.

*USS is a registered trademark*



This mark tells you that  
a product is made of Steel

United States Steel Corporation — Pittsburgh  
Columbia-Geneva Steel — San Francisco  
Tennessee Coal & Iron — Fairfield, Alabama  
American Steel & Wire — Cleveland  
United States Steel Supply — Steel Service Centers  
United States Steel Export Company  
**United States Steel**



## personals

Glenn M. Herring has been promoted to assistant to the vice president-sales, of the **Hanson-Van Winkle-Munning Co.** He joined the H-VW-M sales force in 1930.

**Caloric Appliance Corp.** has announced three supervisory appointments in the service department at the firm's Topton plant. **William B. Thomas** has been named to the newly-created position of director of service; **Leroy F. Brown** moves up to service manager, the post vacated by Thomas; and **Harold Domenico** fills Brown's previous position as product control manager.

**Robert L. Myers** has been appointed a supervising research metallurgist for **Armco Steel Corp.** Myers will head the company's porcelain enameling research.

**Elmer W. Broshot** has been named to the position of assistant sales manager of **Kerns United Corp.**, formerly L. R. Kerns Co. Broshot joined Kerns six years ago.

**David K. Stuart** has been appointed staff assistant to the assistant general sales manager-field sales at the **Crucible Steel Co. of America.** He was formerly manager of the Chicago sales branch. Stuart joined the firm in 1933 as an order expeditor.

**Burnett D. Bruce** has been appointed assistant manager-service at **Chicago Vitreous Corp.** The firm also announced the appointment of **Bernard J. Conner** as service engineer. Bruce has been with the firm since 1941, and Conner joined Chicago Vitreous in 1958.

**Don Schreckengost** has been appointed to the staff of **The O. Hommel Co.** He joined Hommel from the Homer Laughlin China Co. where he was design director. In his new position he will develop new uses for ceramic colors.



HERRING



PETTERSEN



THOMAS



MYERS

**Jack S. Pettersen** has been appointed director of marketing for the **Norge Div., Borg-Warner Corp.** Pettersen will direct all Norge home appliance merchandising operations, including advertising and sales training.

**Charles W. Diven, Jr.**, has been appointed assistant vice president-sales of **Sharon Steel Corp.** He will serve as coordinating officer for the activities of Sharon's various national accounts.

**Edna Poyner** has been appointed assistant home service director for the **Norge Div., Borg-Warner Corp.** She will direct the national Norge home service field staff.

**Willard E. Kendall** has been named to the new position of vice president and director of appliance product engineering and designing service of **Aero-Matic Engineering Co., Inc.** In his new capacity Kendall will assist the gas, oil and electric cooking and heating manufacturers in their product and industrial engineering programs.

**Samuel D. Houston** has been appointed district sales manager for the southern territory of **Robertshaw-Fulton's Grayson Controls Div.** Houston replaces **M. F. Grace**, who was appointed recently as product sales manager for central heating controls. Houston will have his new office in Chattanooga, Tenn.

**Roger A. Milton** has been appointed sales engineer for appliance timers at **General Electric's Appliance Control Dept.**, Morrison, Ill. Prior to his recent appointment he worked on the company's technical marketing program.

**George Maleno, Jr.** has been named project engineer for **CRS Industries, Inc.** He was formerly chief of the engineering department of the **Bryant Air Conditioning Corp.** In his new position he will be in charge of planning the installation of Statronic Systems, a dirt and dust controlling unit.

**Norris Hines** has been promoted to the newly-created post of senior market analyst in **The Maytag Co.'s** market research department. He has been a member of the firm's market research staff since 1957.

**J. E. Workman** has been elevated to president of **Latrobe Steel Co.**, replacing **M. W. Saxman.** Saxman continues as chairman of the board.

**Edward E. Sigg** has been named vice president for manufacturing of **Mechanical Specialties Co.**, a West Coast tooling and machining firm.

**Sherwood J. Smith** has been named to the new position of director of customer quality and services at **Whirlpool Corp.** Smith will be responsible for maintaining product quality and will supervise an internal organization of over 700 employees, parts depot center at LaPorte and Evansville, Ind., and headquarters operations in St. Joseph, Mich. Until his appointment, he was general manager of the two service centers.

Whirlpool also announced changes in its sales organization. **Chester F. Worthington** has been named east-central regional sales manager. **Thomas Stroop**, currently sales manager for gas refriger-

BROSHOT

STUART

CONNER

BRUCE

KENDALL

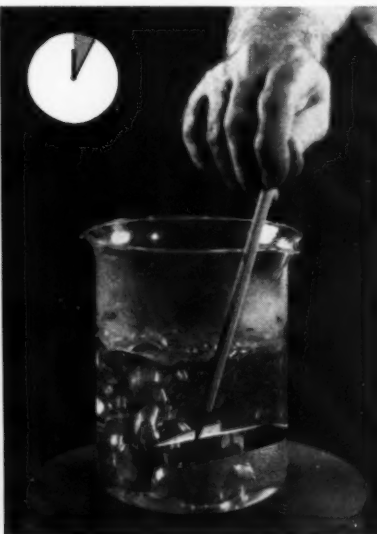
SCHRECKENGOST



**A DRAMATIC DEMONSTRATION OF THE NEW CLAD-REX 102 LAMINATE**



Boiling water provides a positive test for two deep drawn\* vinyl-clad parts. Neither special care in forming, nor post curing has been used to prepare either part.



Almost within a matter of seconds, the part formed of conventional vinyl-clad metal (at right) begins delaminating at the corners.



Even after as long as four hours of boiling, the part formed of new Clad-Rex 102 laminate (at left) still shows no delamination whatsoever.

## New Clad-Rex vinyl-clad metal sharply reduces limitations in deep drawing and heat exposure

Has your interest in vinyl-clad metals been cooled because your product is deep drawn? . . . or because your product is exposed to elevated temperatures? . . .

Now, you can solve the problem with new Clad-Rex 102. It's a new vinyl-metal laminate that is, in effect, a single element of material. Clad-Rex 102 combines *for the first time* the ultimate properties of sheet metal with the optimum characteristics of vinyl.

Call or write for facts of this major technological breakthrough by the extensive research laboratories of Simoniz Company.

\*Depth of draw equal to six times radius of corner



VINYL-METAL LAMINATES BY **CLAD-REX**® DIVISION OF SIMONIZ COMPANY

11520 W. King Street • Franklin Park, Illinois

Telephone: GLadstone 1-2323

22C

74

AUGUST • 1960 MPM



ators, succeeds Worthington as refrigerator sales manager. **Stephen E. Upton**, advertising and promotion manager, utility division, RCA Whirlpool appliances, becomes gas refrigerator sales manager. **William C. Hume**, corporate manager of quality control, becomes refrigerator and freezer product manager.

**James A. Kozel** has been named manager of product engineering for the **Detroit Controls Div., American-Standard**. His responsibilities will include products in the appliance, heating, air conditioning, refrigeration, industrial and thermo-controlled actuator fields.

**T. M. Rutter** has been appointed manager of promotion for **Crucible Steel Co. of America**. He was formerly supervisor of sales promotion and technical literature and company displays.

**Jerold P. Greco** has been promoted from executive vice president to president of **Bigelow-Garvey Lumber Co.**, Chicago. Greco has been associated with Bigelow-Garvey for 24 years. The firm produces shipping and storing containers for the metal products industry.

**M. W. Burleson** has been appointed a general sales manager in the **Johns-Manville Industrial Insulations Div.** He began his career with Johns-Manville in 1936 as assistant district engineer.

**George H. Childers** has been named manager of room air conditioner sales for **Kelvinator Div., American Motors Corp.** He joins the company after two years with the **Airtemp Div., Chrysler Corp.**

**R. A. Emmett, Jr.**, vice president of **Detrex Chemical Industries, Inc.**, has been placed in charge of all Detrex manufacturing — chemical and equipment. He will also direct the activities of the Detrex laboratory and research center in Detroit.

**Leonard J. Lindstrom** has been appointed manager of engineering and research of **Despatch Oven Co.** He will have responsibility for all engineering of the Despatch line of industrial furnaces, finish baking ovens, paint sprayers, metal cleaning equipment, foundry ovens and chemical ovens.

**George A. Schupp** has been named director of engineering of the **Consumer Products Div., The Magnavox Co.** Schupp came to Magnavox from the **General Electric Co.**, where he was manager of advanced product development.



KOZEL



BUTTER



CRANDALL



TIGHE

**L. Berkley Davis**, vice president of the **General Electric Co.** and general manager of GE's electronic components facilities, has been elected president of the **Electronic Industries Association**. He succeeds **David R. Hull**, a vice president of **Raytheon Co.**

**Daniel B. Lamb** has been appointed **Detroit Div. manager for Oakite Products, Inc.** He replaces **Thomas R. Smith**, who is retiring after 19 years as head of the **Detroit Div.** Lamb has been with **Oakite** since 1947.

**J. G. Skaaren** has been appointed to the position of assistant to the president of **Stran-Steel Corp.**, a division of **National Steel**. The firm also announced the appointment of **F. E. Daggett** to succeed **Skaaren** as general sales manager.

**Eugene T. Crandall** has been appointed to the position of vice president, marketing, **Industrial Div.**, and **James M. C. Tighe** to the position of vice president, marketing, **Commercial Div.**, of **The Lux Clock Mfg. Co.**, it has been announced by **Paul Lux**, executive vice president. **Crandall** was previously sales manager of **Lux Industrial Div.**, and **Tighe** had held a similar position for **Lux Commercial Products**.

**Richard E. Clark** has been appointed manager of aluminum product sales at the **Detroit plant of Joseph T. Ryerson & Son, Inc.**

**Alfred Bersted** has been elected president of **McGraw-Edison Co.**, succeeding **Max McGraw**, who becomes chairman of the newly-formed executive committee.



CHILDERS



EMMETT

LINDSTROM



## Industry's NEWEST Production TOOL MOLYKOTE<sup>®</sup> G LUBRICANT

- ALMOST 100% SAFETY AGAINST GALLING AND SEIZING WITH ALL BEARING METAL COMBINATIONS
- ELIMINATES STICK-SLIP, METAL PICK-UP AND DISTORTION IN PRESS FITTING
- REDUCES WEAR-IN TIME AND DAMAGE IN NEW OR REBUILT MACHINERY
- THE HIGHER THE LOADS, THE GREATER THE MARGIN OF SUPERIORITY OF MOLYKOTE G

Write for your free sample of MOLYKOTE G LUBRICANT today. We will also send you a copy of our new Bulletin 126 which gives complete details. THE ALPHA-MOLYKOTE CORPORATION, 65 Harvard Avenue, Stamford, Conn. Phone Firsides 8-3724. Plants in Stamford, Conn., Munich, Germany and Strasbourg, France.

THE ALPHA-MOLYKOTE CORP.  
65 Harvard Ave., Stamford, Conn.  
Please send me a free sample of your MOLYKOTE G Lubricant.

NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



...free standing models  
can be PYRAMIDED  
into built-ins!



With the growing trend toward built-in appliances...and yet with the ever-present market for free-standing models...manufacturers are faced with the problem of selling both markets with minimum production costs. Many of these manufacturers have literally "pyramided" currently tooled free-standing models into smart, up-to-the-minute built-ins...with the simple, economical addition of sparkling, stainless steel trim by Pyramid.

The three-dimensional, complete periphery frame for a thirty-inch range top shown above is but one example. Other models and other appliances lend themselves to the same money-saving, sales building treatment. We'd like to work with you on your problems. Won't you write us today?

**Pyramid Mouldings Inc.**

5365 WEST ARMSTRONG AVE., CHICAGO 46, ILL.—BRONXVILLE, NEW YORK  
WESTERN MOULDINGS INC., 1111 EAST 8TH STREET, UPLAND, CALIFORNIA

## MPM

### industry meetings

#### EASTERN ENAMELERS

Eastern Enamelers Club Annual Outing, Hunsicker's Grove, Alburtis, Pa., August 13, 1960.

#### ENGINEERING

Production Engineering Show, Navy Pier, Chicago, September 6-16, 1960.

#### MACHINERY

Second Coliseum Machinery Show, Chicago Coliseum, Chicago, September 7-15, 1960.

#### DIE CASTERS

The 1960 Annual Meeting of the American Die Casting Institute and the Die Casting Research Foundation, Edgewater Beach Hotel, Chicago, September 14-15, 1960.

#### PORCELAIN ENAMEL

Porcelain Enamel Institute Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., September 26-28, 1960.

#### STANDARDS

The Ninth Annual Meeting of the Standards Engineers Society, Hilton Hotel, Pittsburgh, Pa., September 26-28, 1960.

#### WELDING

The American Welding Society Fall Meeting, Penn-Sheraton Hotel, Pittsburgh, Pa., September 26-29, 1960.

#### IRON AND STEEL

The Association of Iron and Steel Engineers' Exposition and Convention, Cleveland Auditorium, Cleveland, Ohio, September 27-30, 1960.

#### METAL SHOW

Forty-second National Metal Congress and Exposition, Convention Halls and Bellevue-Stratford Hotel, Philadelphia, Pa., October 17-21, 1960.

#### INDUSTRIAL DESIGNERS

American Society of Industrial Designers 16th Annual Conference, Edgewater Beach Hotel, Chicago, October 27-28, 1960.

#### PAINT TECHNOLOGY

Thirty-eighth Annual Meeting of the Federation of Societies for Paint Technology, Hotel Sherman, Chicago, October 31 - November 2, 1960.

# You just can't beat practical "KNOW HOW"

*IF you want better  
enameling results  
at lower costs*

● Sure we have top flight ceramic engineers . . . but . . . there's this difference. These engineers have to prove our Frits under practical working conditions in our own large enameling plant to practical enameling plant technicians.

You can't pass the buck at Ing-Rich . . . the end result, better enameling at lower cost is the main

objective and that objective is achieved because everybody has to prove his case UNDER PRACTICAL WORKING CONDITIONS.

. . .

Our Frit customers are getting better enameling results at lower costs because of this practical "Know How."

Pioneer Producer of  
LIFETIME  
Porcelain Enamel Products

**INGRAM-RICHARDSON, INC.**  
OFFICES, LABORATORY AND PLANT  
FRANKFORT, INDIANA







## New Lead Development Adds

# PEARL

## To Appliance Finishes

The oyster can simply sit back in his shell and wait...but appliance manufacturers cannot be as patient as the oyster, they operate in a highly competitive industry, welcome new techniques that make their products more appealing and salable. Now lead helps you introduce an attractive — a pearlescent — finish for your household appliance line!

This new finish adds pearl-like glamor and rugged durability to appliance finishes because lead salts readily lend themselves to

the manufacture of nacreous pigments. These pigments provide the highest brilliance of any known pearlescent substance.

Pearlescent pigments can be used with a wide variety of vehicles, and may be applied by dipping, spraying, printing, roller coating or brushing.

Let us send you further information on how lead can make your product a glowing success with pearlescent finish — the type of finish with buy-appeal that helps you sell a wide variety of products. Write to Lead Industries Association, 292 Madison Avenue, New York 17, N. Y.

2718

LOOK AHEAD WITH **LEAD**

# METAL PRODUCTS STATISTICS

|                                     |            | 1960<br>(Units) | 1959<br>(Units) | %<br>Change |
|-------------------------------------|------------|-----------------|-----------------|-------------|
| Gas Furnaces                        | May        | 67,000          | 74,400          | - 9.9       |
|                                     | Jan.-May   | 315,400         | 343,200         | - 8.1       |
| Gas Boilers                         | May        | 9,004           | 9,007           | —           |
|                                     | Jan.-May   | 43,402          | 39,426          | +10.1       |
| Gas Conversion Burners              | May        | 8,300           | 6,900           | +20.3       |
|                                     | Jan.-May   | 38,900          | 32,000          | +21.6       |
| Oil-Fired Central Heating Equipment | April      | 41,492          | 41,325          | + 0.4       |
|                                     | Jan.-April | 167,691         | 159,864         | + 4.9       |
| Gas Ranges, Free-Standing           | May        | 112,900         | 130,000         | -13.2       |
|                                     | Jan.-May   | 628,700         | 675,300         | - 6.9       |
| Gas Ranges, Built-In                | May        | 29,800          | 30,300          | - 1.7       |
|                                     | Jan.-May   | 134,400         | 123,200         | + 9.1       |
| Gas Water Heaters                   | May        | 201,700         | 239,300         | -15.7       |
|                                     | Jan.-May   | 1,096,300       | 1,292,400       | -15.2       |
| Gas Vented Recessed Wall Heaters    | May        | 24,500          | 32,400          | -24.4       |
|                                     | Jan.-May   | 134,400         | 159,600         | -15.8       |
| Gas Floor Furnaces                  | May        | 4,700           | 6,600           | -28.8       |
|                                     | Jan.-May   | 26,200          | 30,200          | -13.2       |
| Gas Direct Heating Equipment        | May        | 84,600          | 63,400          | +33.4       |
|                                     | Jan.-May   | 311,200         | 320,700         | - 3.0       |
| Gas Unit Heaters & Duct Furnaces    | May        | 10,300          | 9,600           | + 7.3       |
|                                     | Jan.-May   | 63,600          | 54,800          | +16.1       |
| Gas Incinerators                    | May        | 4,200           | 3,100           | +35.5       |
|                                     | Jan.-May   | 19,900          | 16,000          | +24.4       |
| Electric Household Refrigerators    | May        | 268,000         | 308,200         | -13.0       |
|                                     | Jan.-May   | 1,469,200       | 1,505,300       | - 2.3       |
| Electric Farm & Home Freezers       | May        | 99,200          | 121,700         | -18.5       |
|                                     | Jan.-May   | 467,800         | 525,400         | -10.9       |
| Electric Ranges, Free-Standing      | May        | 62,600          | 71,500          | -12.5       |
|                                     | Jan.-May   | 367,600         | 418,600         | -12.2       |
| Electric Ranges, Built-In           | May        | 55,000          | 61,900          | -11.1       |
|                                     | Jan.-May   | 290,100         | 278,900         | + 4.0       |
| Electric Water Heaters              | May        | 55,300          | 72,300          | -23.5       |
|                                     | Jan.-May   | 292,900         | 356,500         | -15.0       |
| Electric Dishwashers                | May        | 47,000          | 34,500          | +36.2       |
|                                     | Jan.-May   | 236,000         | 193,800         | +21.8       |
| Electric Food Waste Disposers       | May        | 64,000          | 53,600          | +19.4       |
|                                     | Jan.-May   | 304,300         | 285,900         | + 6.4       |
| Combination Washer-Dryers           | May        | 9,589           | 11,604          | -17.0       |
|                                     | Jan.-May   | 70,044          | 76,826          | - 9.0       |
| Washers—Automatic & Semi.           | May        | 176,883         | 207,422         | -15.0       |
|                                     | Jan.-May   | 1,020,782       | 1,111,258       | - 8.0       |
| Washers—Wringer & All Other         | May        | 67,060          | 70,512          | - 5.0       |
|                                     | Jan.-May   | 302,829         | 357,033         | -15.0       |
| Electric Dryers                     | May        | 29,465          | 31,318          | - 6.0       |
|                                     | Jan.-May   | 270,145         | 291,948         | - 7.0       |
| Gas Dryers                          | May        | 24,235          | 14,585          | -66.0       |
|                                     | Jan.-May   | 147,363         | 144,635         | - 2.0       |
| Vacuum Cleaners                     | May        | 265,556         | 257,345         | + 3.2       |
|                                     | Jan.-May   | 1,436,678       | 1,435,216       | + 0.1       |
| Metal Furniture                     | May        | *               | *               | -16.0       |
|                                     | Jan.-May   | *               | *               | - 3.0       |
| †Television                         | May        | 454,471         | *               | *           |
|                                     | Jan.-May   | 2,654,776       | 2,363,091       | +12.3       |
| †Radio (1)                          | May        | 1,277,040       | *               | *           |
|                                     | Jan.-May   | 6,973,069       | 5,677,421       | +22.8       |
| Typewriters                         | May        | 95,800          | *               | *           |
|                                     | Jan.-May   | 432,492         | *               | *           |
| Compressor Bodies (2)               | Jan.-Dec.  |                 | 4,926,657       | +37.0(a)    |
| Steel Barrels & Drums               | April      | 2,483,397       | 3,065,602       | -18.9       |
|                                     | Jan.-April | 9,695,952       | 11,117,203      | -12.7       |
| Steel Pails                         | April      | 5,894,302       | 7,723,823       | -22.4       |
|                                     | Jan.-April | 22,003,773      | 24,851,923      | -11.5       |
| Room Air Conditioners               | May        | 244,600         | *               | *           |
|                                     | Jan.-May   | 888,200         | *               | *           |
| Unitary Air Conditioners (3)        | Jan.-Dec.  |                 | 285,935         |             |
| Heat Pumps                          | Jan.-Dec.  |                 | 35,157          |             |

(1) Including auto receivers

(2) Except for household refrigerators

(3) Including heat pumps

(4) No change

(a) Increase over 1958

\* Not reported

† Output — all other figures are factory shipments or factory sales

Sources for this information: Gas Appliances Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

**IT** (almost anything)

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**packs right  
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2. "Materials Handling, Warehousing and Stacking" is a digest of money-saving methods.



3. "Heavy Loads" explains how extra heavy shipments handle easier in Wirebounds.



4. "Pallet Boxes" shows how to handle items in bulk safely, at low cost.



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Send us (only checked items will be sent)

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Name \_\_\_\_\_

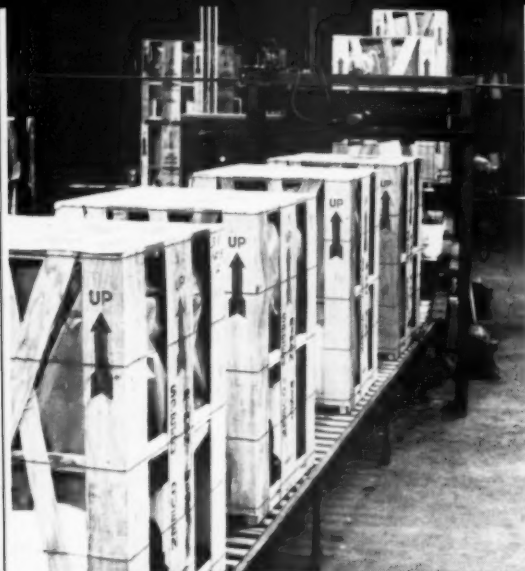
Company \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

IT GETS THERE RIGHT IN

*Wirebound*  
BOXES & CRATES



*Crated automatic washers approach double stacking device preceding storage conveyors. A partly elevated unit is seen in the background.*

AN MPM STAFF FEATURE

EXCLUSIVE MPM PHOTOS

A "THREE-FOR-ONE" storage conveyor system at the Speed Queen Div., McGraw-Edison Co., has streamlined the flow of finished products from the completion of packaging to freight car loading.

The heart of the installation at the Ripon, Wis. plant is a series of nine storage conveyors — three serving each of the main assembly lines. Formerly, only one storage conveyor followed each assembly line. The new arrangement reduces handling, speeds freight car loading, and promotes "first in-first out" storage.

Handling is reduced because the temporary storage capacity of each of the three lines — automatic washer, drier and wringer washer — is approximately tripled. Many of the packaged units that formerly had to be temporarily stored in the warehouse prior to shipping are now directed to one of the storage lines and eventually routed by conveyor directly to the shipping dock. The system also provides maximum flexibility in selecting models of home laundry equipment to fill customers' orders.

For instance, the various models of

automatic washers required to fill a particular order are gathered on one of the three storage conveyors following the automatic washer assembly line. When the order is ready for shipping, the units are conveyed to the loading dock in one "batch." If driers or wringer washers are included in the order, they are accumulated on storage conveyors in a similar manner.

The system offers equal advantages when finished units are to be stored in the firm's warehouse. Since the finished equipment can be grouped together by model, warehouse stacking is simplified.

An additional benefit of the new system is the increased utilization of "first in-first out" storage. By holding finished units on the nine temporary storage conveyors, the number of units stored in the warehouse is reduced.

Thus, washers and driers that are manufactured first are generally shipped first — they are not as likely to be buried at the bottom of a stack in the warehouse.

#### Double stacking

Following each of the three assembly lines is a device which stacks the crates

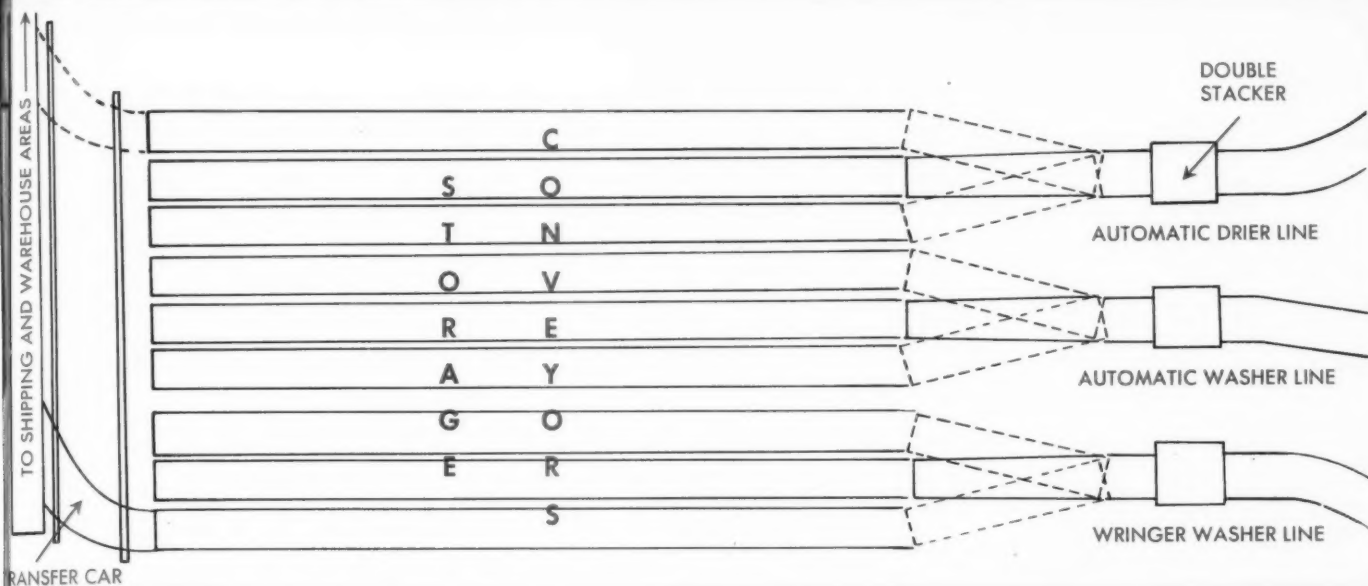
crated units routed to storage conveyors to speed loading

## Speed Queen "3-for-1" system

*General view of storage conveyor system shows movable conveyor in foreground feeding storage conveyor at extreme left.*







two high. The automatic double stacker raises one machine in the air and allows another machine to pass under it. The section of conveyor on which the bottom machine is riding is then elevated slightly and the top machine is lifted off its supporting forks. These forks then retract and the two machines move

(Right) — Ramps for power trucks bridge the gap between the building and the open freight cars.

(Below, right) — Home laundry units are loaded in freight cars two-at-a-time with finger-lift-equipped power truck.

## entreamlines handling and shipping

on. This two-high stacking doubles the capacity of the succeeding conveyors.

Following each double stacker is a movable 15-foot section of power-driven conveyor which can be directed to any one of the three temporary storage conveyors. This conveyor is mounted on wheels and is simply rolled into position and attached to the proper storage conveyor.

The storage conveyors are approximately 56 feet in length and are ripple-live-roller type. This design, which consists of 10-foot sections of "driving"

belts spaced on 10-foot centers, provides evenly spaced movement of the units on the conveyors and prevents jamming.

### Transfer car

At the end of the storage conveyors is a "transfer car" mounted on tracks which run at a right angle to the direction of the storage conveyors. The transfer car is a short, curved section of power-driven conveyor which links the storage conveyors to the main conveyor leading to the loading dock or warehouse.

to Page 92 →

"Transfer car" mounted on tracks feeds units to main shipping line (right).





Cooper-Jarrett . . . **THE TRAFFIC MAN'S LINE** . . . through dependable, helpful, "willing to serve" drivers with an average service of "1½ million mile" Drivers, avoid all delays to always speed your shipments to their destination. Drivers, trained and eager to provide the "extra" service you want together with "Maximum Maintenance" of all Cooper-Jarrett equipment, give you the highest level of service . . . the service you have come to expect from **"THE TRAFFIC MAN'S LINE"** from Cooper-Jarrett.



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WALLINGFORD, CONN.  
NEW YORK, N. Y.

## MPM

new industrial literature

### Gear Honing Developments

An illustrated brochure titled "Newest Developments in Gear Honing" is now available. Described and illustrated in the brochure are the honing principle and a new machine called the Red Ring Model GHD gear honing machine.

A comprehensive table listed production data for present industry gear tooth honing applications is given on the back page along with a discussion of honing considerations. Write Dept. MPM, National Broach & Machine Co., 5600 St. Jean, Detroit 13, Mich.

### Ballizing Bulletin

A 12-page technical bulletin on the ballizing process for high-speed low-cost sizing and finishing has been announced. This process consists of pressing a precision ball through the unfinished hole, and brings holes accurately to size with low microinch finish. The bulletin tells how the process works, describes the conditions best suited to ballizing, lists production and cost advantages, and shows production setups ranging from hand ballizing to fully automatic machines. Write Dept. MPM, Industrial Tectonics, Inc., 3686 Jackson Rd., Ann Arbor, Mich.

### Flash-Butt Welders

A new brochure describes B-5 Flash-Butt Welders with photographs of various types and applications. The description covers complete tabulation of welding capacities, electrical specifications, mechanical specifications, automatic and semiautomatic controls, hand and air-operated clamping fixtures, welding electrodes, backups and weld upsetting mechanisms. Write Dept. MPM, The Taylor Winfield Corp., 1048 Mahoning Ave., Warren, Ohio, and ask for Bulletin 7-213A.

### Punches, Shears and Presses

Hydraulically operated presses for punching, forming, shearing, notching, bending, coping, squeezing and riveting are described in a 56-page catalog. The new literature also describes the company's line of portable and bench-mounted hand-operated punches and presses, as well as tooling for both hand and power-operated units. Write Dept. MPM, W. A. Whitney Mfg. Co., 636 Race St., Rockford, Ill.

### Piercing and Punching Catalog

A new 36-page catalog includes many new, patented piercing accessories as well as a complete line of shoulder punches, interchangeable ball seat punches, pilot punches and set screw punches.

Described are a wide selection of shank sizes and overall lengths with round, square, oval or rectangular punch points in standard stocked fractional sizes or decimal sizes. An added feature covered in the catalog is a line of slug ejector punches which are available in a choice of three types, in all point shapes and shank styles.

Also featured is the company's new line of Cone-Lock punches in all types of punch points in shank diameters from 3/16 to one inch. Radial-Lock stripper bushings are offered in straight-through type or in two-step types for clearance on punch shank or for guiding on punch shank.

The entire line is completely illustrated and charted with all dimensions and sizes available as standard stocked sizes or specials. Prices are also included.

To obtain a free copy of the Catalog, write Special Projects Editor, Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

### Metallizing Booklet

A new revision of the Recommended Practices for Metallizing Shafts or Similar Objects has been published by the American Welding Society. The 32-page booklet contains diagrams, line drawings and photographs, and many tables.

Most of the material has been rewritten to bring it up-to-date and the contents have been rearranged for quicker reference. A new section has been introduced on surface preparation for metallizing. To obtain a copy of the booklet send \$1 to American Welding Society, Dept. T, 33 W. 39th St., New York 18, N. Y.

### Chip Handling Systems

Metal chip handling systems for automatic, continuous crushing and de-oiling of metal chips and turnings are described in a new 12-page booklet. Included in the booklet are photographs and diagrams of custom-engineered systems for both large and small plant operations that require mass matching of ferrous or non-ferrous parts such as

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## editorial voice of the national safe transit program

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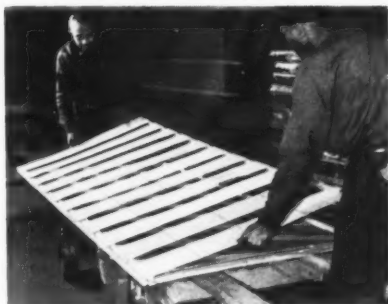
DANA CHASE PUBLICATIONS, INC.

Devoted to improving packaging shipping, and materials handling methods for the appliance and metal products manufacturing industries. This section contains information on plant experience and industry advances for improving packaging and shipping methods, and prevention of in-transit loss. It also contains information on the National Safe Transit Committee's preshipment testing program and reports on NST activities.

### Flat Wirebound Crate

A recently developed shipping container, said to make it easier for receivers of high value sheet metal to unpack without scratching or damaging the contents, has been announced by Wirebound Box Mfrs. Assn.

The container, a flat wirebound crate, is opened by disengaging wire loop fasteners or cutting twisted wire closures, snipping and removing several reinforcing wire loop closures along the edges, and lifting away the top of the crate.



With about 700 pounds of stainless steel sheets packed with corrosion inhibitor paper in the wirebound blank lying cleats upward on the dolly used as a packaging table, the other wirebound blank is placed cleats downward so that its cleats rest snugly against those of the other blank.

### Dispenser Cuts Packing Time

Mystik Adhesive Products, Inc., Chicago, has introduced a new strapping tape dispenser that speeds up packing operations and helps shippers cut costs.

Known as the "Time Saver," the new dispenser is light in weight, easily portable, and features a simple tension adjustment that provides the right tension needed for a good banding job on each application. A trigger-action cutter permits snipping off the exact length of tape needed.

Write Mystik Adhesive Products, Inc., 2635 N. Kildare Ave., Chicago 39, Ill.

### NSTC Addresses Representatives

"Modern claim prevention starts before the product leaves the factory — is strengthened in transit — and ends with a satisfied customer." This definition of modern claim prevention was given by William M. Wilkinson, secretary of the National Safe Transit Com-

mittee, Inc., at the recent annual membership meeting of the National Freight Claim Council of the American Trucking Association.

Wilkinson explained the operation of the NSTC program and emphasized to the Claim Council that participation in the program in no way obligates the carrier, other than the moral obligation to at least give the best handling possible to any manufacturer who is doing everything he can to deliver his goods in an undamaged condition.

He also announced the recent formation of the NSTC Technical Services Advisory Council, which is comprised of well-known industry representatives. The purpose of the Advisory Council is to serve as a clearing house for technical information and developments affecting the manufacturing and shipping industry; to maintain technical liaison with each of the industry areas involved; and to provide continuing research for new technical developments in the packaging, handling, and transportation fields.

### Claim Prevention Contest Winners Receive Safe Transit Awards

Safe Transit Awards were presented for the first time at the 23rd annual meeting of the National Freight Claim Council of the American Trucking Association, Inc., June 16, at Minneapolis.

Members of the trucking industry selected to receive Safe Transit recognition were claims representatives of those companies winning first place in classes in the Annual National Freight Claim Prevention Contest. There were three contest classes consisting of: Class A —

carriers with revenues of \$8 million and over; Class B — from \$3 to \$8 million; and Class C — under \$3 million.

The First Place winners were: Class A — Carolina Freight Carriers Corp., Inc., Cherryville, N. C., J. L. Boies, vice president, Claims & Insurance; Class B — Miller Motor Express, Inc., Charlotte, N. C., E. L. Roberson, general claim agent; and Class C — Central New York Freightways, Inc., Syracuse, N. Y., B. B. Coon, claim agent.

(Left to right) — W. M. Wilkinson, secretary, National Safe Transit Committee, Inc., Washington, D. C.; J. L. Boies, vice president, Claims & Insurance, Carolina Freight Carriers Corp., Inc., Cherryville, N. C.; E. L. Roberson, general claim agent, Miller Motor Express, Inc., Charlotte, N. C.; B. B. Coon, claim agent, Central New York Freightways, Inc., Syracuse, N. Y.; and R. C. G. Witt, acting executive secretary, National Freight Claim Council of the American Trucking Association, Inc., Washington, D. C.





## New literature

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found in automotive, aviation, bearing and other metalworking industries. Write MPM Dept. PR, Link-Belt Co., Prudential Plaza, Chicago 1, Ill., and ask for Book 2926.

## Soak Cleaners

A new technical bulletin, No. 360, describes a number of soak cleaners. The eight cleaners discussed, both granular dustless compounds and liquid cleaners, represent general fields of use and indicate the range of the company's

line. Included are applications and features of the specific cleaners, recommended cleaning time and temperature at which each is used. Write Frederick Gumm Chemical Co., 538 Forest St., Kearny, N. J.

## Motor Selector

An eight-page "Motor Selector" lists a complete motor and generator line ranging from 1/40 to 300 hp. They include a complete line of standard motors in a broad range of voltages and speeds. Write Dept. MPM, Howell Electric Motors Co., Howell, Mich., and ask for Bulletin L-1661A.

## Detecting Instrument

A one-page bulletin describes a time-speed recorder designed to detect hidden trouble in machine operations and processes. The instrument monitors automatic equipment, providing a graphic record of short-duration events to millisecond accuracy, along with time-of-day information.

According to the manufacturer, split-second timing makes it possible to locate equipment malfunction or other difficulties often missed by stop-watch time studies. Write Dept. MPM, R. B. Annis Co., 1101 N. Delaware St., Indianapolis 2, Ind., and ask for Bulletin TS-60.

## Set Screw Inserter

A review of the relative economics of set screw installation — by hand, by power tool and by automatic inserter — is featured in a four-page bulletin. The literature covers an improved model of the Setomatic automatic set screw inserter capable of 2500 insertions an hour. The unit can be used as an attachment to a single machine or as part of a fully automated production line. Write Advertising Dept., Box 1089, Standard Pressed Steel Co., Jenkintown, Pa., and ask for Bulletin 2302.

## Small AC Motors

A line of small AC special-application motors, offering 16 hp ratings between 1/100 and 1/3 hp, is described in Bulletin 445. The motors have been designed for quiet running in small areas, with most frequent uses coming in office appliances, blowers, fans and small electric tools.

The eight-page bulletin lists construction features, ratings, and dimensions or 32 specific models in the line.

Write Dept. MPM, Fractional HP Motor Div., Robbins & Myers, Inc., Springfield, Ohio.

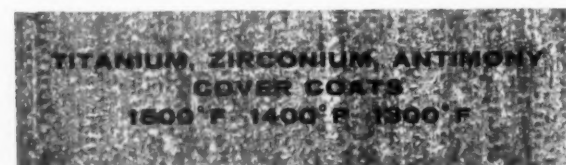
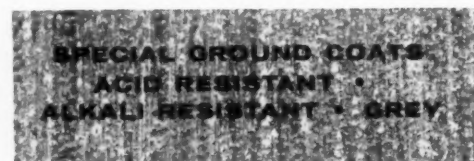
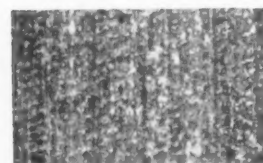
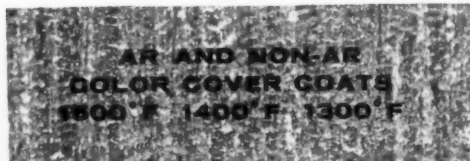
## Combination Finishing Machine

A four-page, illustrated bulletin describing a new combination finishing machine is now available. According to the manufacturer, the new machine, with standard four-inch abrasive belt and 12-inch abrasive disc, was designed for use where custom or production finishing operations must be performed efficiently and economically.

Numerous action photographs and text included in the bulletin describe in detail the specific operations that this machine can perform. Write Dept. MPM 1014, Walker-Turner Div., Rockwell Mfg. Co., 400 North Lexington Ave., Pittsburgh 8, Pa.

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02







### Bethnamel Folder

A new six-page folder, No. 734, describing Bethnamel, a new enameling sheet, is now available. The folder describes Bethnamel as being ideal for either two-coat or direct-on enameling.

Graphs are used to compare properties of Bethnamel with those of other enameling steels. Other statistics and information are also included in the folder. Write MPM, Publications Dept., Bethlehem Steel Co., Bethlehem, Pa.

### Electric Surface Units

Information on a new line of electric surface units for range and hotplate manufacturers is contained in a new bulletin. The Topp Burner units are reportedly going to be introduced to the market in September. Write Dept. MPM, Still-Man Mfg. Corp., 429 E. 164th St., New York 56, N. Y.

### Phosphating Reference Chart

A folder describing Paintite, a new phosphate coating, and a phosphating reference chart are now available. Advantages claimed in the booklet include superior cleaning, temperature versatility, low foaming and uniform coating. For a copy of the reference chart and full details on Paintite, write Dept. MPM, Turco Products, Inc., 24600 S. Main St., Wilmington, Calif.

### Infrared Bulletin

Technical Bulletin 59-220 discusses infrared source theories and laws, prediction of quantity and quality of radiation from heated sources, color blindness and other technical points. Write Dept. MPM 41, Fostoria Corp., Infrared Div., Fostoria, Ohio.

### "Plant Tour" Brochure

A recently published two-page brochure takes the reader on a tour of a new 45,000-sq.-ft. plant devoted to the manufacture of springs, metal stampings and wire forms. Each step in the entire operation of the plant, the manufacture of springs, wire forms and metal stampings, is illustrated with photographs and drawings. Write Dept. MPM, Stanley Spring Mfg. Co., 5050 W. Foster Ave., Chicago 30, Ill.

### Zirconium Data File

The latest technical information and data on Zirconium is compiled in a new Zirconium Data File. The booklet is illustrated with numerous charts, pictures, tables and graphs. Write Dept. MPM, Zirconium Information Center, Carborundum Metals Co., Akron, New York.

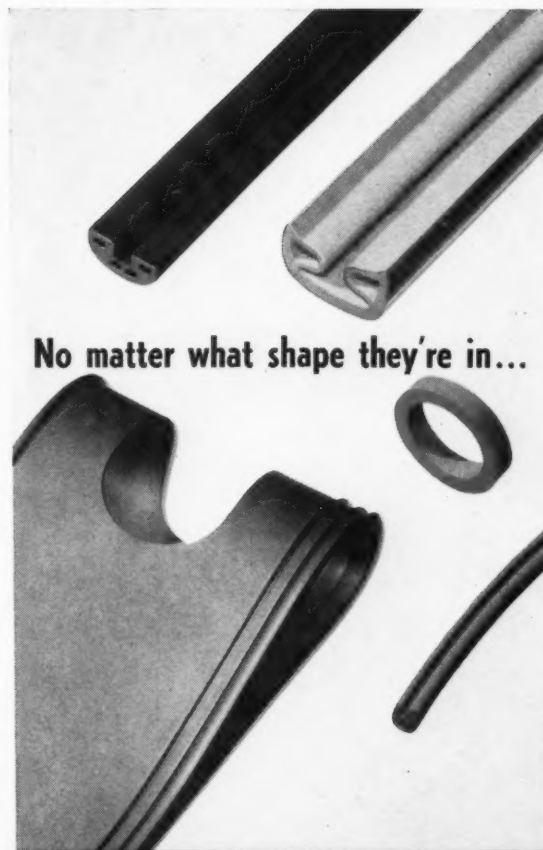
### Automatic Welding

A six-page, two-color folder illustrates and describes a complete line of automatic and semiautomatic arc welding equipment. Applications for different automatic welding processes are also illustrated. Write Dept. MPM, Hobart Brothers Co., Troy, Ohio.

### Automated Processing Equipment

A new two-color, 16-page, fully illustrated booklet describes the latest cost-cutting developments in automated processing equipment for handling steel, stainless, brass and aluminum coils in manufacturing plants and warehouse service centers. Described are slitting lines, leveling and cut-to-length lines, as well as special processing lines for coating, pickling, cleaning and press feeding. Write Dept. MPM, Production Machinery Corp., Box 104, Mentor, Ohio.

to Page 89 →



No matter what shape they're in...

# CIPCO

(A DIVISION OF ESSEX WIRE CORPORATION)

produces high quality extruded  
plastic components for appliances,  
in quantity... competitively priced.

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information and samples.



**CAROLINA INDUSTRIAL PLASTICS**  
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NEW FLAME DETECTOR makes possible the FIRST

# KWIK-SENSOR

by **WHITE-RODGERS**

*Kwik-Sensor can be applied by the manufacturer to any domestic oil burner in minutes...and no adjustments or relocation of the flame detector are necessary even though the burner may be used in different types of furnaces or boilers having various types of combustion chambers.*

## Fast, Simple Installation

The Kwik-Sensor flame detector need only be positioned to pick up the radiant rays of the oil flame. The primary control can be mounted in or on the burner, in the furnace or boiler vestibule, or in any convenient spot. No special engineering required.

## New Flame Detector Location

The Kwik-Sensor flame detector is mounted at the blower end of the burner assembly—away from the flame area. Here it operates in a clean, cool stream of air—where field tests have proved it is not affected by soot, dirt or heat, and where it does not disturb the primary air pattern or interfere with servicing of burner.

## Instantaneous Response

Unlike heat-sensing control elements that require a time interval to respond, the Kwik-Sensor is a flame-sensitive resistor which reacts *instantly* to flame ignition or extinction. It responds only to the *radiant rays from the oil flame* and not to heat from the red-hot refractory or light from the ignition spark.

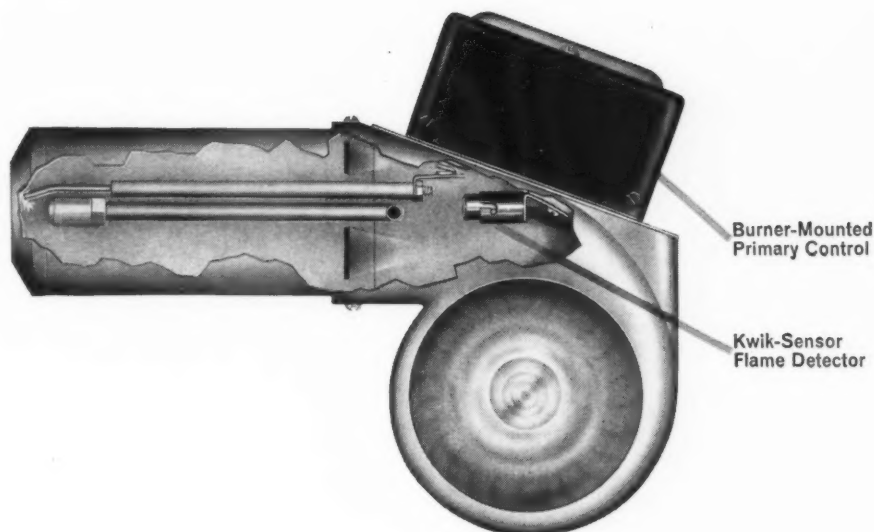
## Complete "Factory Checked" Equipment

Kwik-Sensor makes possible a *fully wired* furnace, burner or boiler unit... all quality controlled *in the factory*. This means production-line economies... simplified inventories... and the elimination of problems long associated with the many variables of in-the-field stack mounted control installations.

.....

*Write now for specifications, dimensions, wiring diagram, and additional facts.*

# Practical Burner-Mounted Oil Burner Control

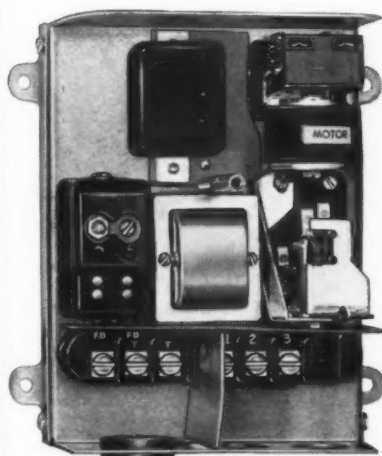


## Not an Electronic Control

The Kwik-Sensor has no transistors, amplifiers or vacuum tubes. It is a simple, safe, dependable design using a new flame detector to operate standard primary control elements familiar to any serviceman. No educational programs are necessary.

## Fail-Safe Operation

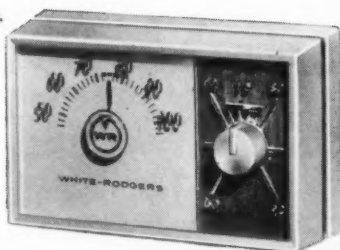
Kwik-Sensor protects against flame failure, ignition failure and power failure. Because of its split-second response, Kwik-Sensor puts standard domestic primary safety components into action with greater speed than any other flame detector now on the market.



Type 660-3 Kwik-Sensor  
Primary Control  
(constant ignition)



Type 956-1  
Kwik-Sensor  
flame detector



TYPE 120-215 D'LUXline Thermostat  
Sealed mercury contacts. Adjustable heat anticipation. Exclusive level bubble mounting aid. Distinctive straightline styling. Terra-beige case, clear plastic face with etched gold dial, birch veneer background.

# NOW...

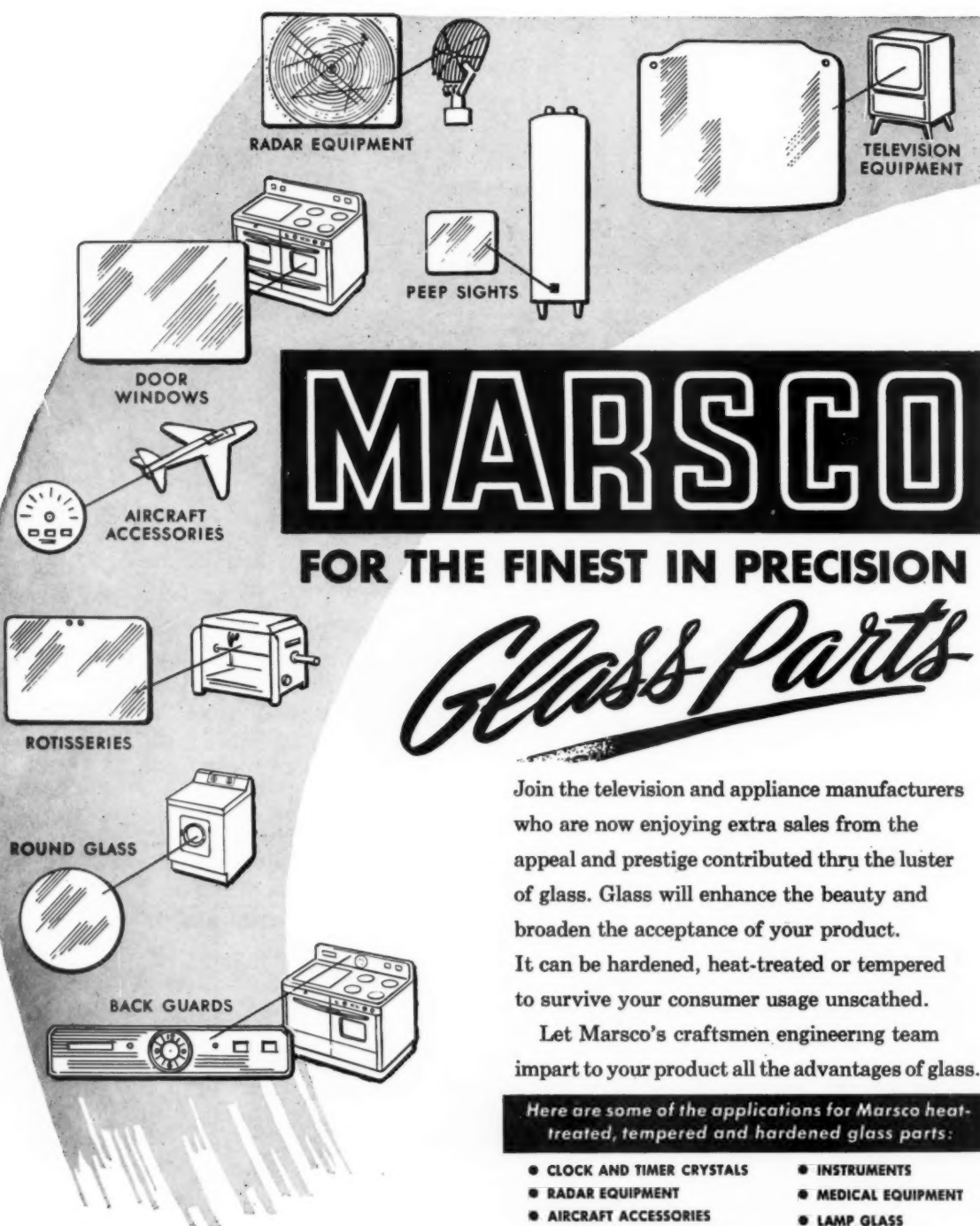
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Control  
Package  
for  
Domestic  
Oil Burners

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Toronto 8, Canada, 611 Gerrard St. East  
Basel, Switzerland, Munchensteinerstrasse 2





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It can be hardened, heat-treated or tempered to survive your consumer usage unscathed.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

*Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:*

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| • AIRCRAFT ACCESSORIES  | • LAMP GLASS                       |
| • OVEN DOOR WINDOWS<br>for both Conventional and<br>Built-In Ranges | • SHELVEING                        |
| • LIGHT LENSES  | • ROTISSERIES                      |
| • PHOTOGRAPHIC EQUIPMENT  | • WASHING MACHINES                 |
| • DIALS AND NAME PLATES   | • DRYERS                           |
| • TELEVISION EQUIPMENT  | • PEEP SIGHTS FOR<br>WATER HEATERS |

*Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.*

ask for the man from

*Marsco*

MARSCO MFG. CO., 2901 S. HALSTED ST., CHICAGO 8, ILL.

## New literature

→ from Page 85

### Silicone Engineering Guide

A recently published 12-page engineering guide explains how various physical forms of silicones contributed to reliability, miniaturization, modularization and environmental protection. The well-illustrated handbook contains engineering data and processing information on silicones, including details of the important electrical and mechanical properties of the silicones most useful in electronics. Write Dept. MPM, Dow Corning Corp., Midland, Mich.

### High-Pressure Spray Washing

A brochure describing three models of machines for high pressure spray washing of paint masks is currently available. Advantages explained are time and labor savings, protection of fine wire bridging on masks, and low solvent consumption. Write Dept. MPM, Conforming Matrix Corp., 434 Toledo Factories Building, Toledo 2, Ohio.

### Stripper Selection Chart

A complete line of low-cost strippers, including hot alkaline, cold solvent and flush-off types, are detailed in a "Stripper Selection Chart." Some of the variables in stripping which are covered by the chart are thickness of paint, base metal, cycling time, safety rules, and method of handling. Write Dept. MPM, L. R. Kerns Co., 2659 E. 95th Street, Chicago 17, Ill.

### Anode Bulletin

A bulletin describing a full line of anodes, anode accessories and chemicals for electroplating and metal finishing has recently been offered. Specifications and recommended applications are given for several styles of anode bags and seven types of anodes. The bulletin lists salts commonly used in electroplating baths and a number of brighteners used in the company's solutions. Write Dept. MPM, Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J.

### Laminated Plastics Guide

An easy-to-use "Laminated Plastics Selection Guide," which combines a 12-page manual with a quick-reference chart of characteristics for 21 commonly used laminate grades, has just been published.

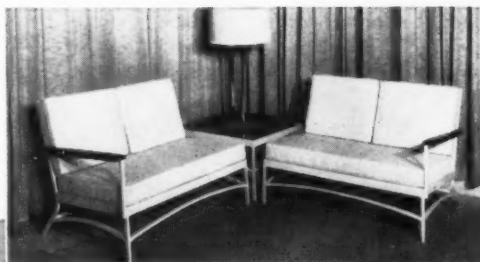
The manual includes considerable handbook information for specifying and ordering laminated plastics. Write Dept. MPM, Taylor Fibre Co., Norristown, Pa.

## What Would

# 75% PAINT SAVINGS

## Mean in YOUR Finishing Department?

**Designed for the New Decade**—Beautifully styled BAL HARBOUR line of aluminum furniture by AFCO was winner of the 1960 Apollo Award for pre-eminence in design. The uniform, high quality finish is applied electrostatically with the Ransburg No. 2 Process Hand Gun.



**Faster . . . Cleaner . . . Cheaper**—The "wrap-around" feature of the No. 2 Process Electrostatic Hand Gun paints all areas of this type of work from one side only, providing a 75% paint savings and a 700% increase in production volume over former air hand spray.

### RANSBURG

Ransburg No. 2 Process Electrostatic Hand Guns are providing a 75% paint savings in the painting of beautiful AFCO aluminum furniture.

AFCO Aluminum Furniture Co., Inc., Miami, Fla., replaced hand spray with two Ransburg Electrostatic Hand Guns. Along with paint and labor savings, quality of the work was improved with greater uniformity. And, production volume was increased a healthy 700%! Formerly, they were painting approximately 100 items a day. NOW, with the faster, cleaner Electrostatic Hand Guns, they paint from 700 to 800 pieces per day. Electrostatic is faster because the "wrap-around" characteristic of Electro-Spray paints all areas of this type of work with a pass from one side only.

### NO REASON WHY YOU CAN'T DO IT TOO

Write for information and literature about this revolutionary, new painting tool. See how the Ransburg Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. If your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochures which show numerous examples of modern production painting in both large and small plants.

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## COMING FEATURES

### GENERAL

14TH ANNUAL HOME LAUNDRY SECTION — SEPTEMBER  
PRECISION PRODUCTION AT SEEBURG CORP.  
WHAT CAUSES APPLIANCE MOTORS TO FAIL?  
RESEARCH AND DEVELOPMENT FACILITIES  
AT WESTINGHOUSE (COLUMBUS)

### DESIGN

LADY KENMORE PROGRAMMING CONTROLS  
THE NEW SERVEL ICEMAKER  
GAS BURNER DESIGN DATA

### FABRICATION

FABRICATING ALUMINUM BASE ALLOYS  
(2ND INSTALLMENT OF 3-PART FEATURE)  
NAMEPLATES WITH FLAME-CUT LETTERING  
SLITTING AND SHEARING AT UTILITY APPLIANCE CORP.  
FABRICATION AT SPEED QUEEN

### FINISHING

NEW 650-FOOT STEEL COATING LINE  
CAST IRON COOKWARE GOES MODERN  
A SURVEY OF THERMOSETTING ACRYLIC PAINTS

### SAFE TRANSIT

HOW TAPPAN USES THE NST TESTS  
MECHANIZED MATERIALS HANDLING AT WESTINGHOUSE





## Question for the home laundry equipment industry

At the 1960 Appliance Technical Conference, the chairman of one of the sessions raised a pertinent question for engineers in the home laundry industry. Due to a shortage of available time, it was suggested that any answers to the question be sent direct to MPM. While it was indicated that answers would be sent, none have been received to date.

The question was something like this:

*With the more complicated requirements for home washers, involving new types of fabrics, etc., and presumably an increased requirement for accuracy in water temperatures, how can this be accomplished through the use of mixing valves that do not have thermostatic control?*

The proponent of the question mentioned that it was his understanding that a high percentage of the mixing valves in use on current home laundry equipment *do not* have thermostats.

MPM would welcome any answers from engineers or management men in the home laundry field to this apparently pertinent question.

"Some day the world will understand the tremendous power of understatement."

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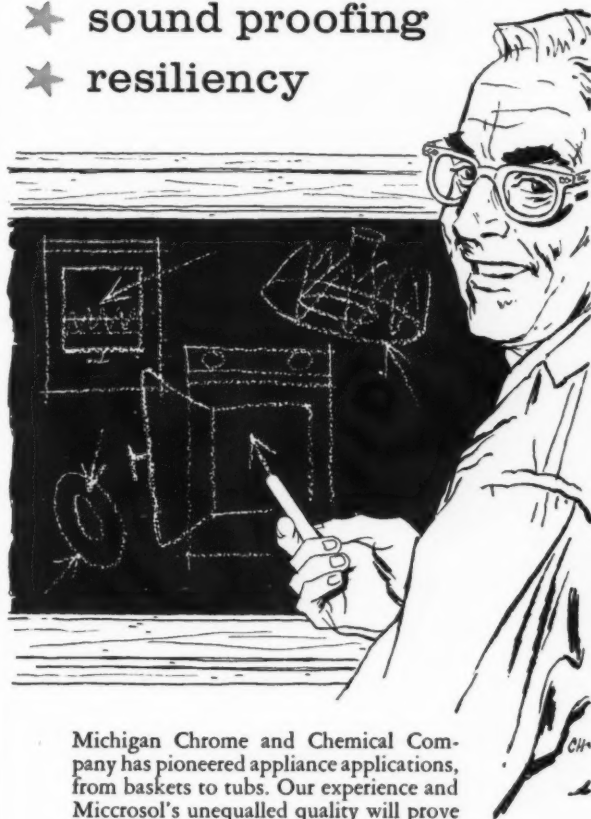
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## Speed Queen

→ from Page 81

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On the shipping dock, the conveyor runs parallel to the line of railroad cars. A deflector guides the units to a take-off section in front of the proper car, and the units are loaded in the car (two at a time) with power trucks equipped with finger-lift devices.

Finished units intended for storage are diverted to another take-off conveyor and stacked up to six high in the warehouse.

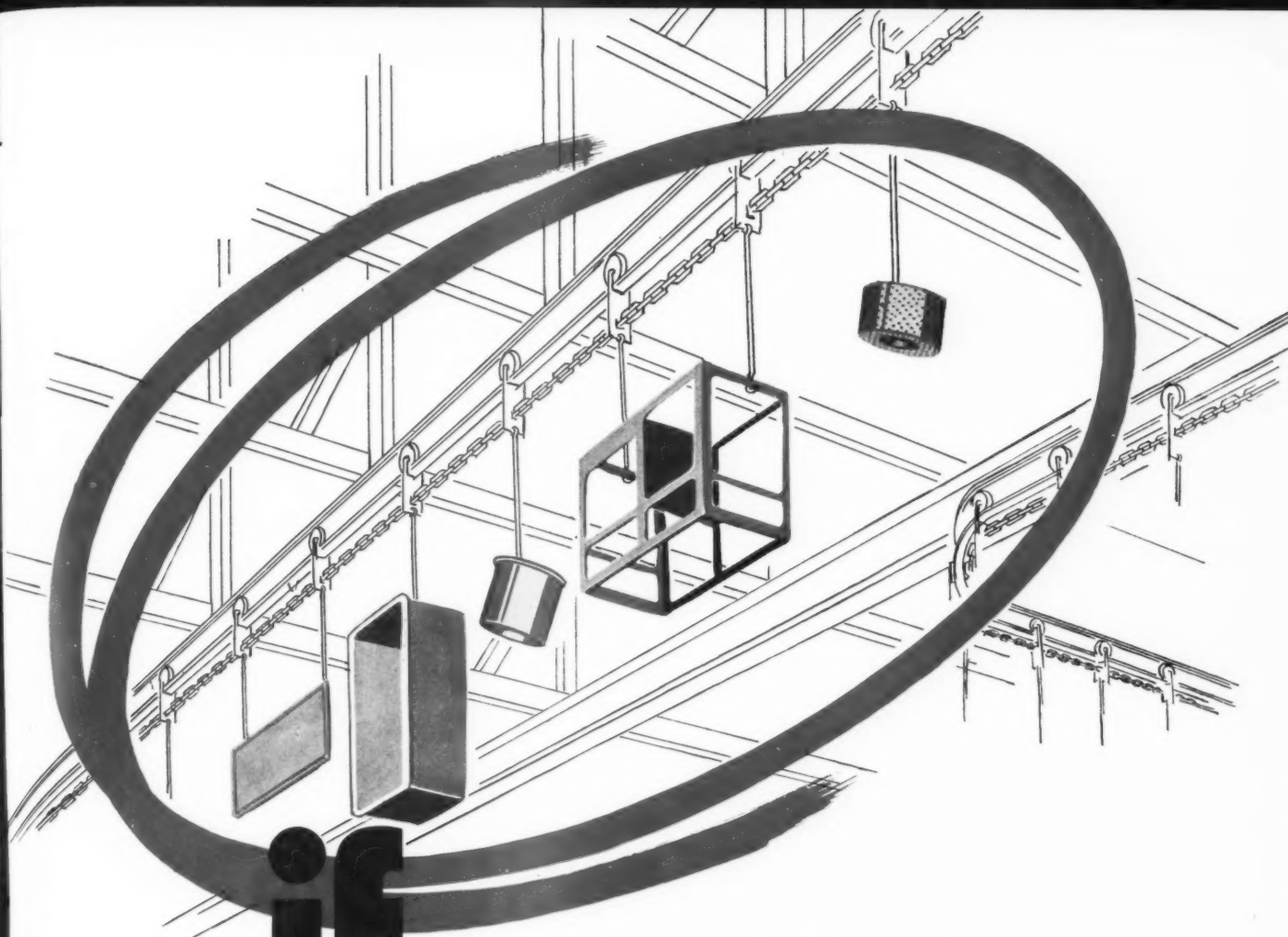
## EIA President Forecasts

### "Unlimited" Growth

The nation's electronics industry can look forward to "unlimited" future growth, according to David R. Hull, president of the Electronic Industries Association.

Speaking at the EIA's recent convention in Chicago, Hull said the industry has become such a vital part of so many operations in the nation's defense, space exploration, commerce, industry and entertainment that it cannot fail to go forward.

He referred to EIA marketing data department forecasts that the industry would be operating at an annual level of \$20 billion by 1970, which would be twice the rate of current sales.



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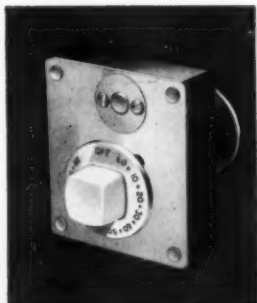




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## 2 TOGGLE SWITCHES

The unusual simplicity of the new TEP Toggle Switch design achieved by Tuttle Research Engineers, now provides a dependable, top-quality switch at lower cost. Considerably smaller than comparative switches offering the same variety of contacts, it includes provisions for four-way wiring connections. There are only 11 working parts, and the complete switch weighs less than one ounce.



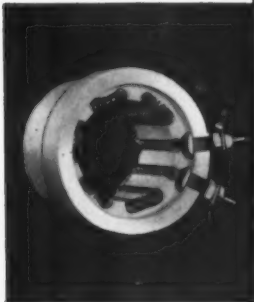
## 3 HEAT SELECTOR SWITCHES

Series 3000 rotary snap-type switches, also manufactured by TEP for electric ranges, air conditioners, space heaters and related applications, feature positive, trouble-free contact action and 7-heat selection. They are available either with or without a pilot light and with different shafts and handles to suit your needs. Write today for sample and quotation.



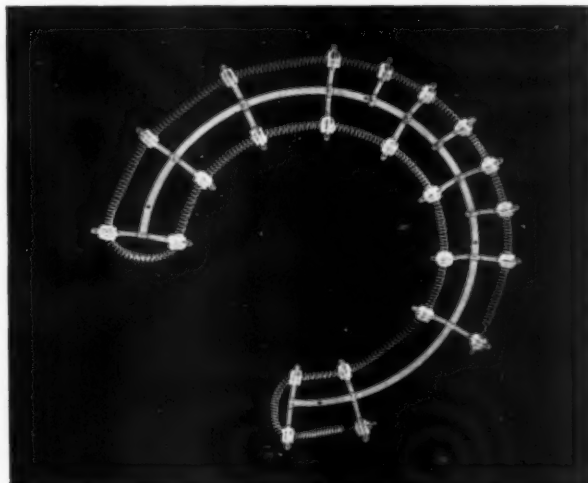
## 4 TUBULAR HEATING ELEMENT

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## For Appliance and Related Applications

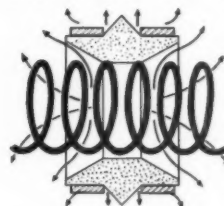
Here is the present line of Tuttle products designed to help you manufacture better electrical products. New in the group are the single position infinite control and the tubular heating element. The Single Position Infinite Control was formerly manufactured and sold by Tuttle & Kift, Inc., and we are pleased to announce our acquisition of the manufacturing and sales rights to this highly efficient control. The Tubular Heating Element was recently designed by us for use in hand dryers. It has many other possible uses. We would welcome the opportunity of working with you on any of your problems involving any one or more of these, or other electrical products. Merely call or write.



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